# FRONT SUSPENSION

# FS

## FRONT SUSPENSION > General Description

### CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description". Ref. to REPAIR CONTENTS>Repair Contents.
- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- Be sure that the surface of brake disc and brake pad is free from grease or oil.
- When performing work on the sensors or modules, be careful of the following.
  - Before disconnecting electrical connectors, be sure to disconnect the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  - Do not apply any impact. If the parts are accidentally dropped, replace with a new part.
  - Do not expose to high-temperature and humidity.
- When replacing the parts provided with memory functions, record the memory contents before disconnecting the ground terminal from the battery sensor.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When handling oil or fuel, adhere to the following to prevent unexpected accident.
  - Be careful with fire.
  - Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.
  - Follow all government and local regulations concerning disposal of refuse when disposing.
- Before starting works, remove dirt and corrosion around the target area.

## FRONT SUSPENSION > General Description

### SPECIFICATION

**Note:**

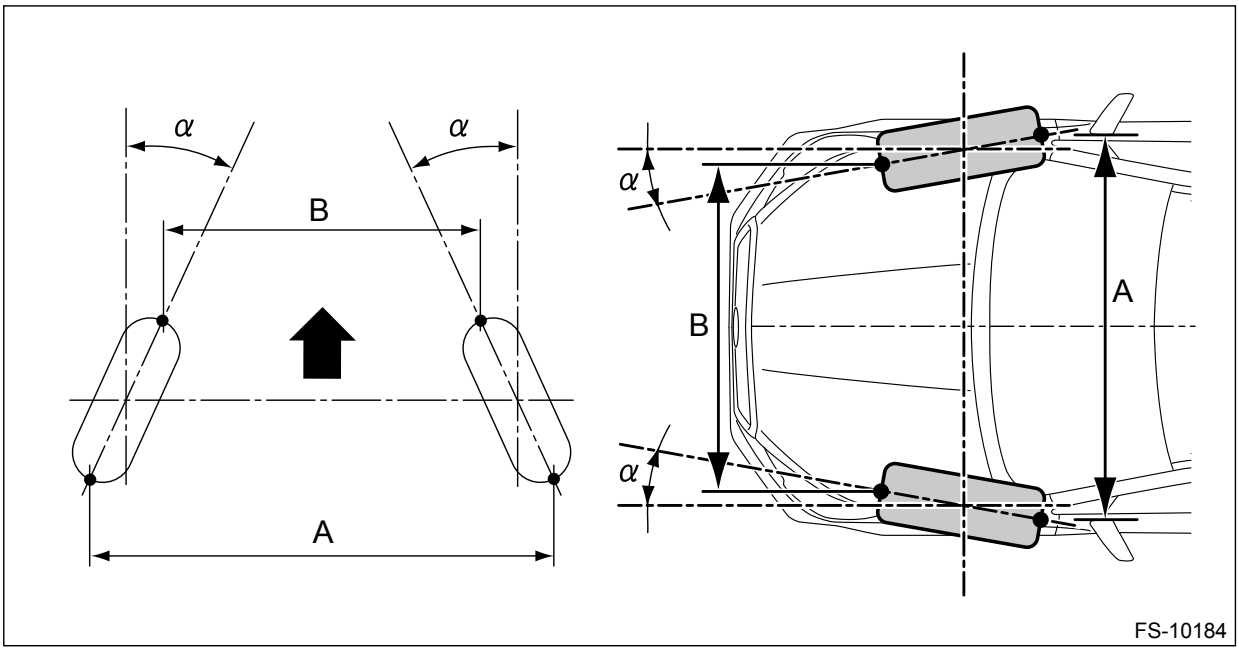
- **Front toe-in, rear toe-in and front camber can be adjusted. Adjust if the value of toe-in or camber exceeds the tolerance range of the specification chart.**
- **Other items except for front toe-in, rear toe-in and front camber that are described in the specification chart cannot be adjusted.**
- **If other items exceed the tolerance range of the specification chart, check the suspension parts and connections for deformation. If defective, replace them with new parts.**

### 1. FRONT WHEEL ALIGNMENT (INSPECTION VALUE)

| | |
|---|---|
| Suspension height<br>(Tolerance: $^{+24\ mm}_{-12\ mm}$<br>mm (in) | 133 (5.24) |

| | | |
|---|---|---|
| ($^{+0.94\ in}_{-0.47\ in}$)) | | |
| Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less) | | 0°00′ |
| Caster (referential value) | | 5°55′ |
| Steering angle (tolerance: ±1.5°) | Inner wheel | 36.9° |
| | Outer wheel | 31.2° |
| Toe-in mm (in) | | 0±3 (0±0.12)<br>Toe angle (sum of both wheels): 0°±0°15′ |
| Kingpin angle (referential value) | | 15°30′ |

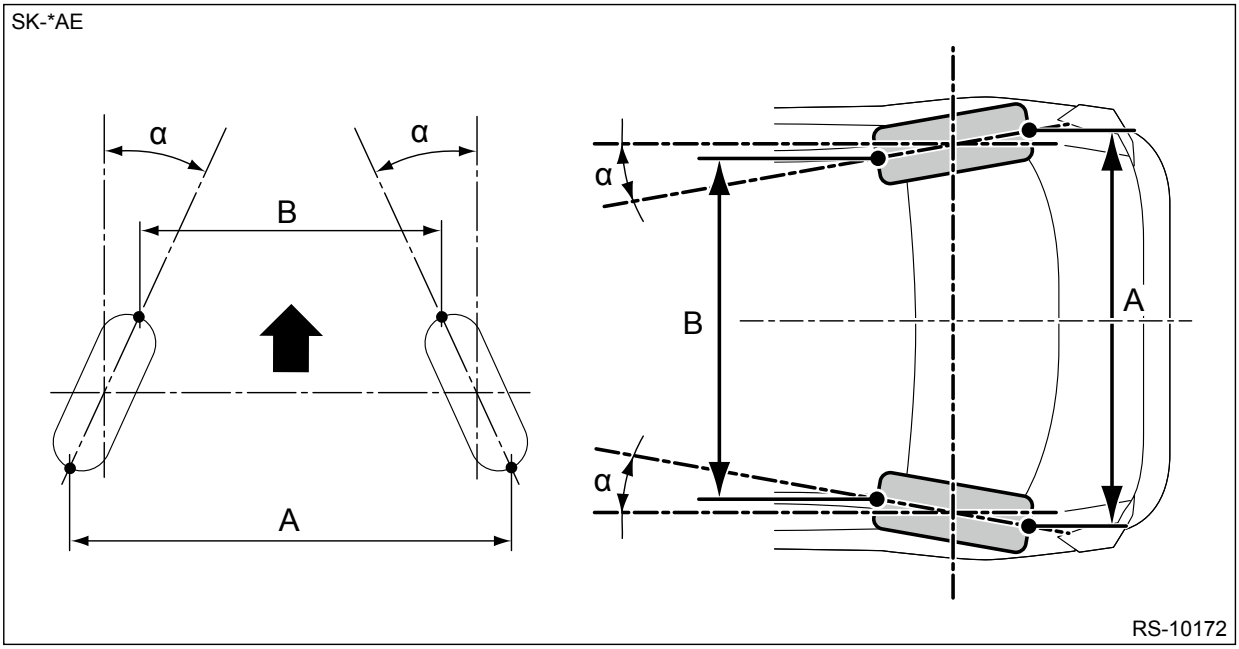
**A − B = Positive: Toe-in, Negative: Toe-out**
**α = Individual toe angles**




## 2. REAR WHEEL ALIGNMENT (INSPECTION VALUE)

| | | |
|---|---|---|
| Suspension height<br>(Tolerance: $^{+24\ mm}_{-12\ mm}$<br>($^{+0.94\ in}_{-0.47\ in}$)) | mm (in) | 3 (0.12) |
| Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less) | | −1°10′ |
| Toe-in | mm (in) | 2±3 (0.08±0.12)<br>Toe angle (sum of both wheels): 0°10′±0°15′ |
| Thrust angle (tolerance: ±30′) | | 0°00′ |

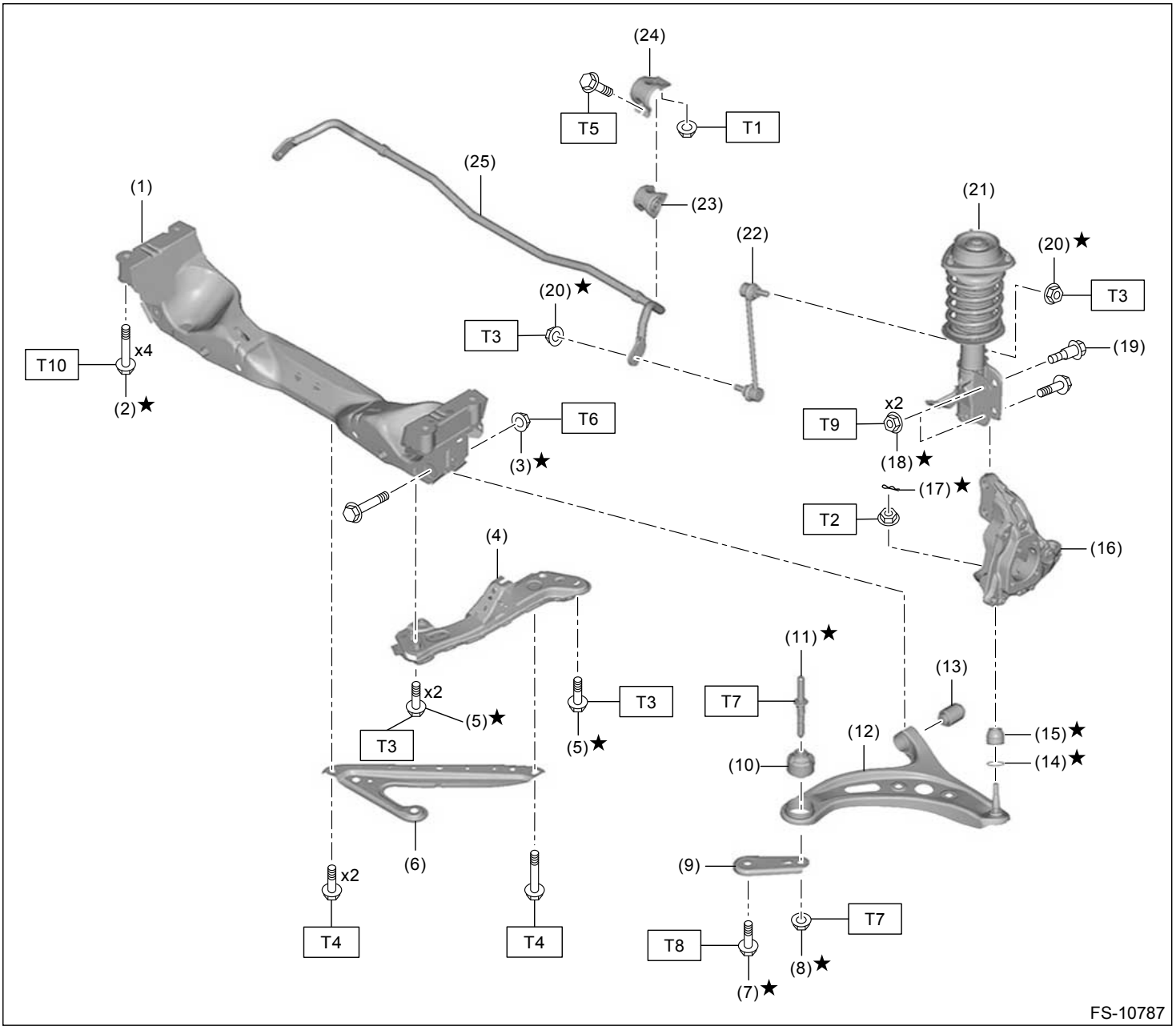
**A − B = Positive: Toe-in, Negative: Toe-out**
**α = Individual toe angles**






## COMPONENT

### 1. FRONT SUSPENSION




| | | | | |
|---|---|---|---|---|
| (1) | Crossmember COMPL front | (14) | Clip | ***Tightening torque: N·m (kgf-m, ft-lb)*** |
| (2) | Flange bolt | (15) | Dust cover | ***T1: 25 (2.5, 18.4)*** |
| (3) | Self-locking nut | (16) | Front axle housing LH | ***T2: 51 (5.2, 37.6)*** |
| (4) | Sub frame COMPL LH | (17) | Snap pin | ***T3: 60 (6.1, 44.3)*** |
| (5) | Flange bolt | (18) | Flange nut | ***T4: 70 (7.1, 51.6)*** |
| (6) | Sub frame front LWR C COMPL LH | (19) | Flange bolt*2 | ***T5: 75 (7.6, 55.3)*** |
| (7) | Flange bolt | (20) | Flange nut | ***T6: 85 (8.7, 62.7)*** |
| (8) | Self-locking nut | (21) | Strut ASSY LH | ***T7: 110 (11.2, 81.1)*** |
| (9) | Plate arm front LH | (22) | Stabilizer link front LH | ***T8: 145 (14.8, 106.9)*** |
| (10) | Rubber bushing arm front | (23) | Rubber bushing stabilizer | ***T9: 155 (15.8, 114.3)*** |

front

(11) Stud bolt*1

(24) Clamp stabilizer

***T10:*** Ref. to FRONT SUSPENSION>Crossmember>INSTALLATION.

(12) Arm ASSY front LH

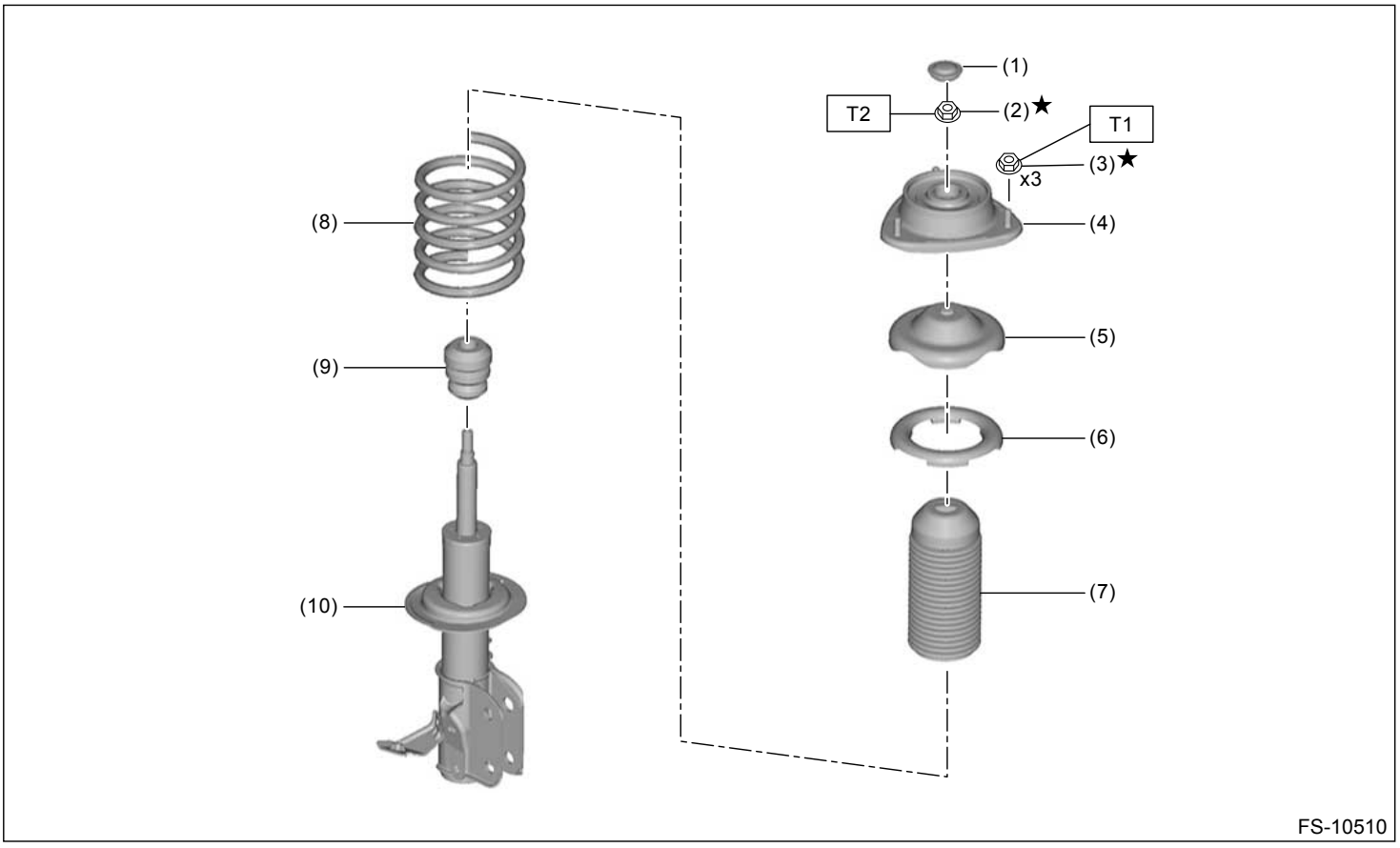
(25) Stabilizer front

(13) Rubber bushing arm rear

*1: Do not reuse the stud bolt when it has been removed from the vehicle.

*2: When adjusting the camber angle, replace the flange bolt with a service part.

## 2. FRONT STRUT




(1) Dust seal

(2) Self-locking nut

(3) Flange nut

(4) Mount strut front

(5) Spring seat UPR front

(6) Rubber seat UPR front

(7) Dust cover front

(8) Coil spring front

(9) Helper front

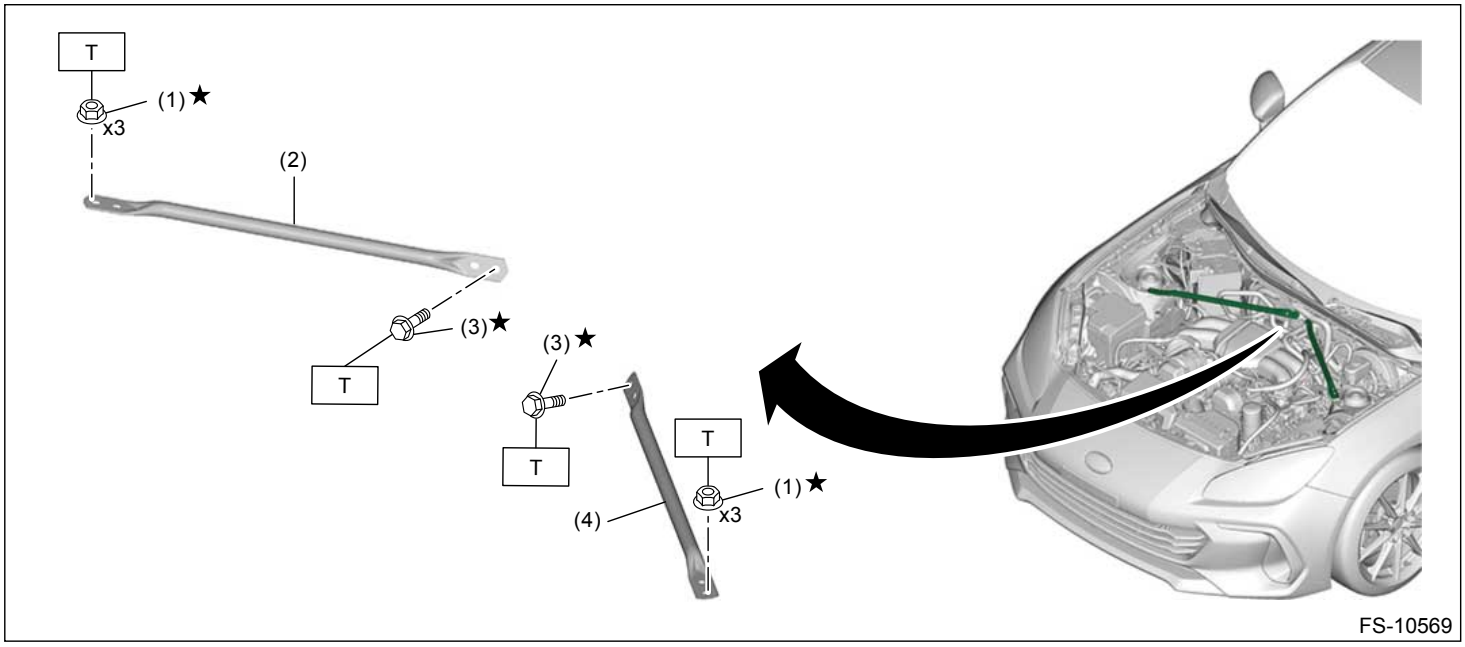
(10) Strut COMPL front

***Tightening torque: N·m (kgf-m, ft-lb)***

***T1: 23 (2.3, 17.0)***

***T2: 55 (5.6, 40.6)***

## 3. STRUT TOWER BAR

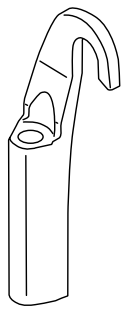


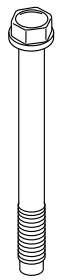
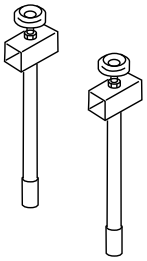
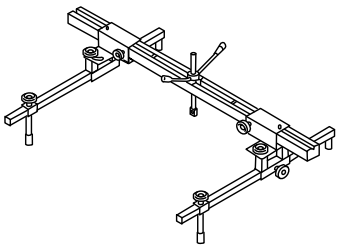
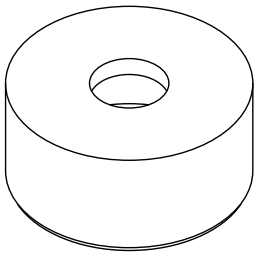

| | | |
|---|---|---|
| (1) Flange nut | (3) Flange bolt | ***Tightening torque: N·m (kgf-m, ft-lb)*** |
| (2) Strut tower bar RH | (4) Strut tower bar LH | ***T: 16 (1.6, 11.8)*** |

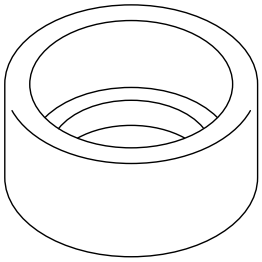
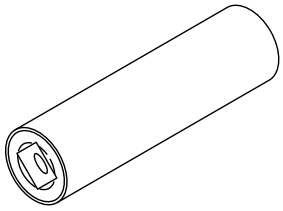
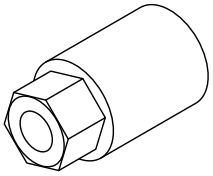
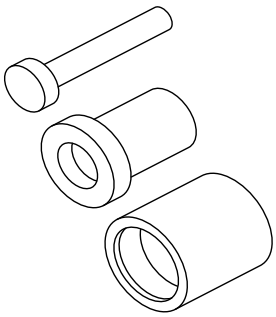
## FRONT SUSPENSION > General Description

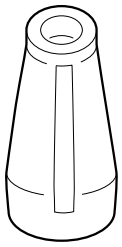
## PREPARATION TOOL

### 1. SUBARU SPECIAL TOOL

| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|---|---|---|---|
|  ST1228138150 | 12281-38150 | ENGINE HANGER NO.1 | • Used for removing and installing crossmember COMPL front.<br>• Used together with BOLT (90119-14120). |
| | 90119-14120 | BOLT | • Used for removing and installing crossmember COMPL front.<br>• Used together with ENGINE HANGER NO.1 (12281-38150). |

| | | | |
|---|---|---|---|
|  ST9011914120 | | | |
|  ST18679AA020 | 18679AA020 | ADJUSTER | • Used for removing and installing crossmember COMPL front.<br>• Used together with ENGINE HANGER (99099AJ000). |
|  ST99099AJ000 | 99099AJ000 | ENGINE HANGER | • Used for removing and installing crossmember COMPL front.<br>• Used together with ADJUSTER (18679AA020). |
|  ST20299AG000 | 20299AG000 | REMOVER | • Used for replacing front arm front bushing.<br>• Used together with BASE (20299AG010). |
| | 20299AG010 | BASE | • Used for replacing front arm front bushing.<br>• Used together with REMOVER (20299AG000). |

| | | | |
|---|---|---|---|
|  ST20299AG010 | | | |
|  ST20299AG020 | 20299AG020 | STUD BOLT SOCKET | Used for removing and installing the stud bolt for front arm installing portion. |
|  ST-20399AG000 | 20399AG000 | STRUT MOUNT SOCKET | • Used for disassembling and assembling the strut assembly.<br>• Used for checking torque of the strut assembly center nut. |
|  ST-927680000 | 927680000 | INSTALLER & REMOVER SET | Used for replacing the rubber bushing arm rear of the front arm. |
| | 20099CA000 (Newly adopted tool) | CLIP INSTALLER | Used for replacing front arm dust cover. |

| | | | |
|---|---|---|---|
|  ST20099CA000 | | | |
|  STSSM4 | — | SUBARU SELECT MONITOR 4 | Used for setting of each function and troubleshooting for electrical system.<br>**Note:**<br>• **For detailed operation procedures, refer to "Help" of application.**<br>• **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).** |

## 2. OTHER

| | REMARKS |
|---|---|
| Alignment gauge | Used for measuring wheel alignment. |
| Alignment gauge adapter | Used for measuring wheel alignment. |
| Turning radius gauge | Used for measuring wheel alignment. |
| Toe-in gauge | Used for toe-in measurement. |
| Dial gauge | Used for measuring the runout of strut COMPL front. |
| Magnet stand | Used for measuring the runout of strut COMPL front. |
| Coil spring compressor | Used for disassembling and assembling the strut assembly. |
| Ball joint puller | Used for disconnecting the ball joint. |
| Shackle | Used for removing and installing crossmember COMPL front.<br>**Note:**<br>**Load capacity: Use a shackle with a load capacity of 250 kg (551 lb) or more.** |

## INSPECTION

Check the following items before performing the wheel alignment measurement.

- Tire inflation pressure
- Uneven wear of RH and LH tires, or difference of sizes
- Tire runout
- Excessive play and wear of ball joint
- Excessive play and wear of tie-rod end
- Excessive play of wheel bearing
- Right and left wheel base imbalance
- Deformation and excessive play of steering parts
- Deformation and excessive play of suspension parts

Check, adjust and measure the wheel alignment in accordance with the following procedures.

| | | |
|---|---|---|
| 1 | Suspension height (front and rear wheels) | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > SUSPENSION HEIGHT. |
| ↓ | | |
| 2 | Camber (front wheel) | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CAMBER.<br>Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > CAMBER (FRONT WHEEL). |
| | Camber (rear wheel) | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CAMBER.<br>**Note:**<br>**Rear camber cannot be adjusted. If the value exceeds the specification, check the suspension parts and connections for deformation. If defective, replace with new parts.** |
| ↓ | | |
| 3 | Caster (front wheel) | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CASTER. |
| ↓ | | |
| 4 | Adjustment of difference between right and left steering angles | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > STEERING ANGLE.<br>Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES. |
| ↓ | | |
| 5 | Front toe-in | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > FRONT TOE-IN.<br>Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT TOE-IN. |

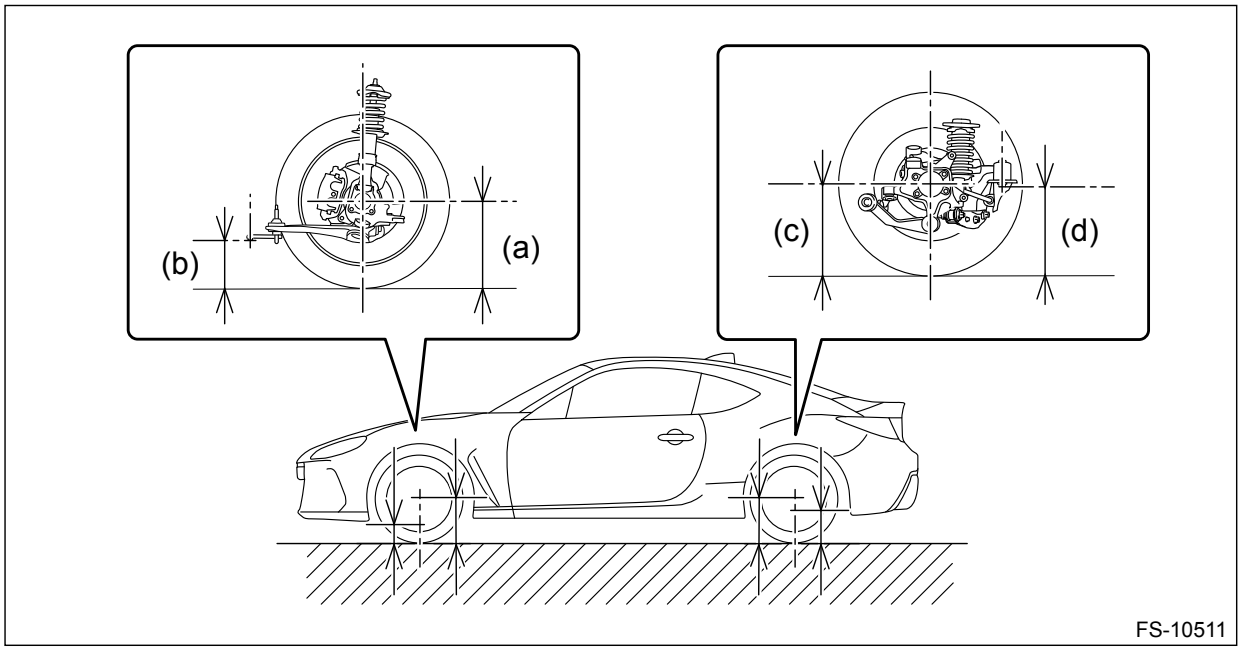
| | | |
|---|---|---|
| | ↓ | |
| 6 | Rear toe-in | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > REAR TOE-IN.<br>Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > REAR TOE-IN. |
| | ↓ | |
| 7 | Thrust angle | Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > THRUST ANGLE.<br>Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > THRUST ANGLE. |

## 1. SUSPENSION HEIGHT

1. Park the vehicle on a level surface.
2. Empty the vehicle so that it is at "curb weight".

**Note:**
**Unload any cargo, load the jack, service tools, spare tire, or tire puncture repair kit, and fill up the fuel tank.**

3. Set the steering wheel in a straight-ahead position, and stabilize the suspension by moving the vehicle in a straight line for 5 m (16 ft) or more.
4. Measure the distance (a) from the center of front wheel to the ground surface.
5. Measure the distance (b) from the end of mounting bolt for the plate arm front to the ground surface.
6. Measure the distance (c) from the center of rear wheel to the ground surface.
7. Measure the distances (d) from the end of mounting bolt for the support sub frame rear to the ground surface.
8. Calculate the suspension height using the following calculation:
   **(a) − (b) = Front suspension height**
   **(c) − (d) = Rear suspension height**



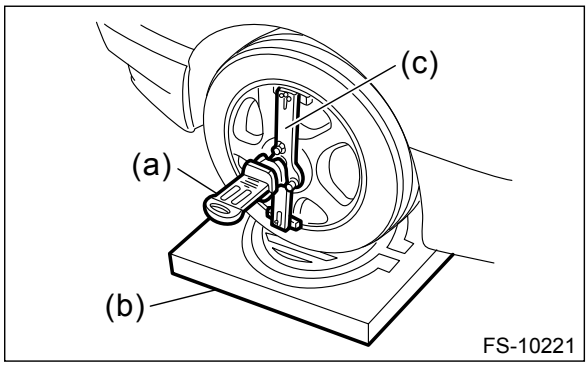
| Suspension height specification mm (in) (Tolerance: $^{+24\ mm}_{-12\ mm}$ ($^{+0.94\ in}_{-0.47\ in}$)) | |
|---|---|
| **Front (a) − (b)** | **Rear (c) − (d)** |
| 133 (5.24) | 3 (0.12) |

## 2. CAMBER

1. Place the tires on the turning radius gauge.

**Note:**
**Make sure that the ground contact surfaces of the front tires and rear tires are at the same level.**

2. Set the alignment gauge adapter into the center of wheel, and then set the alignment gauge.




(a) Alignment gauge
(b) Turning radius gauge
(c) Alignment gauge adapter

3. Measure the camber angle in accordance with the operation manual for alignment gauge.

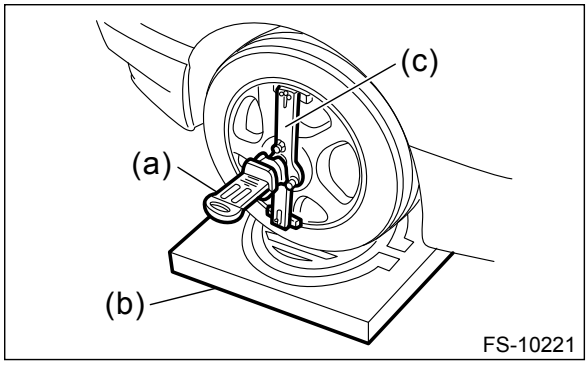
| Front camber (difference between RH and LH 45′ or less) | Rear camber (difference between RH and LH 45′ or less) |
|---|---|
| 0°00′±0°45′ | −1°10′±0°45′ |

## 3. CASTER

1. Place the front tires on the turning radius gauge.

**Note:**
**Make sure that the ground contact surfaces of the front tires and rear tires are at the same level.**

2. Set the alignment gauge adapter into the center of wheel, and then set the alignment gauge.




(a) Alignment gauge

(b) Turning radius gauge

(c) Alignment gauge adapter

***3.*** Measure the caster angle in accordance with the operation manual for alignment gauge.

| Caster |
|---|
| 5°55′ |

## 4. STEERING ANGLE

***1.*** Place the front tires on the turning radius gauge.

**Note:**
**Make sure that the ground contact surfaces of the front tires and rear tires are at the same level.**

***2.*** While depressing the brake pedal, turn the steering wheel fully to the left and right.

***3.*** With the steering wheel held at each fully turned position, measure both the inner and outer wheel steering angles.

| Inner wheel | Outer wheel |
|---|---|
| 36.9° | 31.2° |

## 5. FRONT TOE-IN

***1.*** Set the toe-in gauge in the position at wheel axis center height behind the right and left front tires.

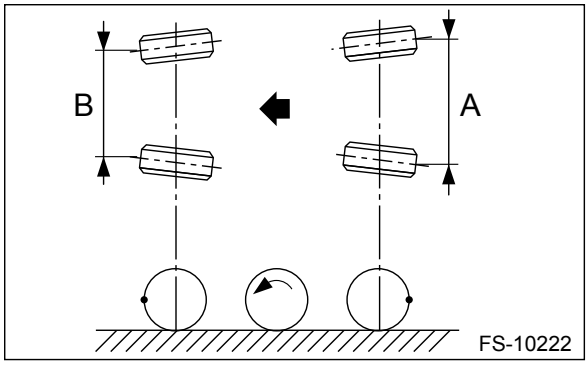
***2.*** Place a mark at the center of both left and right tires, and measure distance “A” between the marks.

***3.*** Move the vehicle forward to rotate the tires 180°.

***4.*** Measure the distance “B” between the left and right marks.

Find toe-in using the following calculation:

**A − B = Toe-in**




**Toe-in: Inspection value**

0±3 mm (0±0.12 in)

## 6. REAR TOE-IN

Refer to the FRONT TOE-IN for rear toe-in inspection procedures. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > FRONT TOE-IN.

**Toe-in: Inspection value**

2±3 mm (0.08±0.12 in)

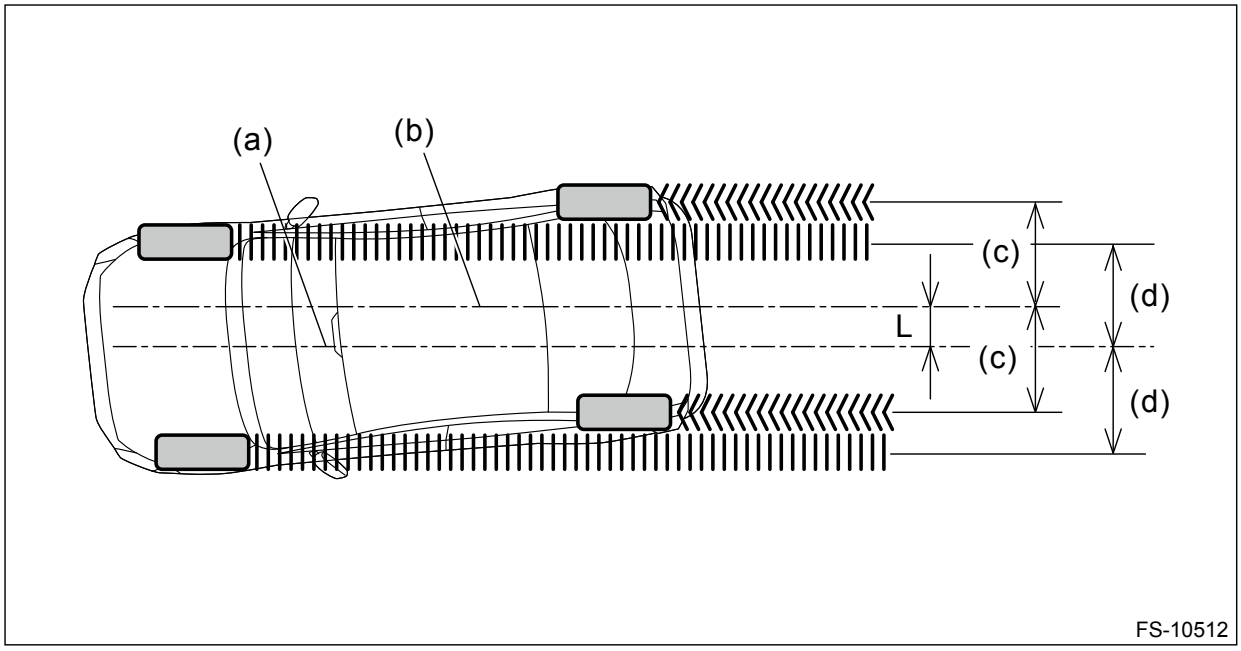
## 7. THRUST ANGLE

1. Park the vehicle on a level surface.
2. Move the vehicle 3 — 4 meters (10 — 13 ft) straight forward.
3. Draw the center of loci for both the front and rear axles.
4. Measure distance "L" between the center lines of the axle loci.

**Thrust angle: Inspection value**

0°00'±30'

Less than 30' when "L" is 23 mm (0.9 in) or less.




(a) Center line of loci (front axle) (c) Same distance (d) Same distance

(b) Center line of loci (rear axle)

## FRONT SUSPENSION > Wheel Alignment

## ADJUSTMENT

**Caution:**

**When the wheel alignment has been adjusted, set the VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.**

**Note:**

**Adjust with the value less than the inspection value, taking aging variation into consideration.**

### 1. CAMBER (FRONT WHEEL)

**Note:**

- **The camber angle can be adjusted within ±0°45′ in this procedure.**
- **Rear camber cannot be adjusted.**

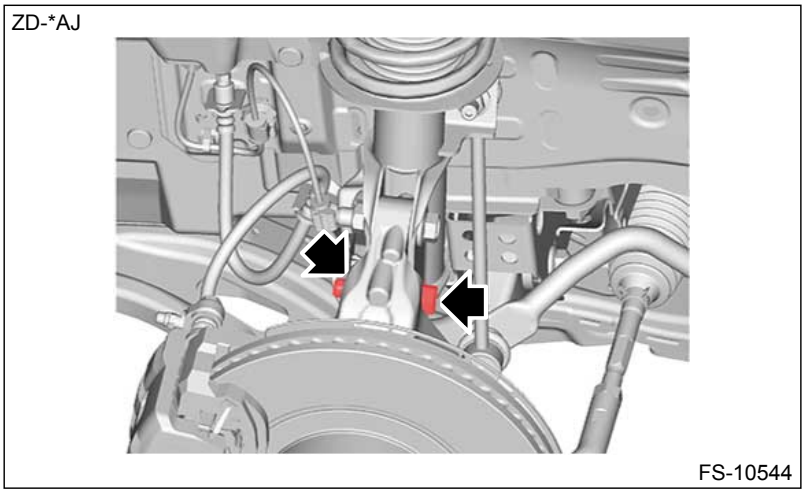
Adjust the camber angle to the following value.

| Camber (difference between RH and LH 35′ or less) |
|---|
| 0°00′±0°30′ |

***1.*** Loosen the lower bolts and nuts securing the strut assembly.

**Caution:**

**Loosen the nut side while holding the bolt side.**



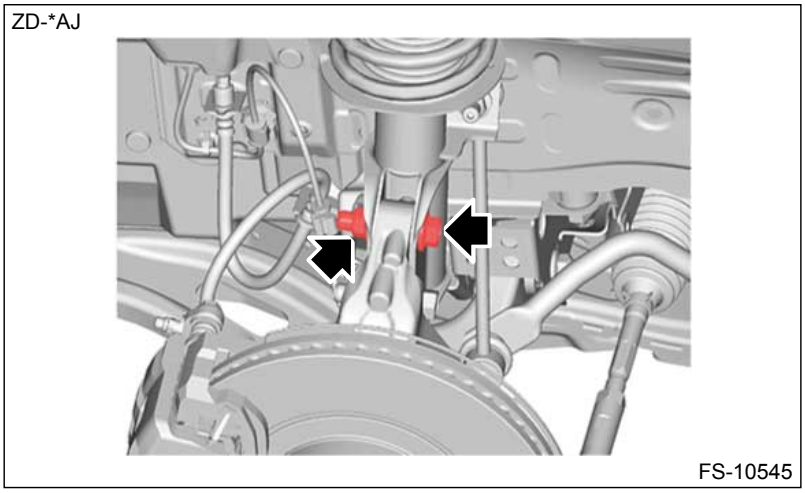

***2.*** Replace the upper bolt which holds the strut assembly with a service part.

**Caution:**

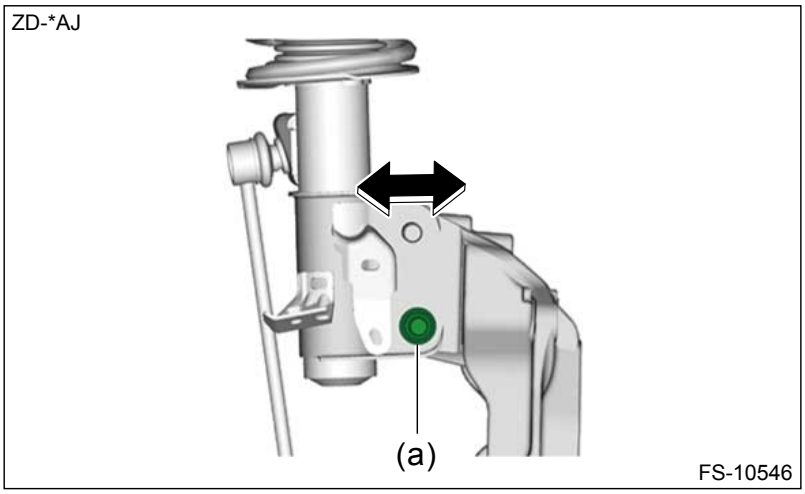
- **Turn and remove the nut while holding the bolt side.**
- **Insert the bolt from the rear of the vehicle.**

**Service part:**

Flange bolt (part No. 901000394)




3. Adjust the camber using the lower bolt (a) securing the strut assembly as a fulcrum.




4. Tighten two new flange nuts.

**Caution:**
**While holding the bolt side, tighten the nut to the specified torque.**

**Tightening torque:**
155 N·m (15.8 kgf-m, 114.3 ft-lb)

## 2. ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES

1. Operate the steering system from lock to lock and stop operating it at the center position from lock to lock, and then install the steering wheel in the straight-ahead position.

**Note:**
**Using of the Subaru Select Monitor and the data of [Steering angle] will facilitate your work. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.**

2. Before adjusting toe-in, be sure to adjust the steering wheel in the straight-ahead position (steering wheel rotational angle: 0 deg).

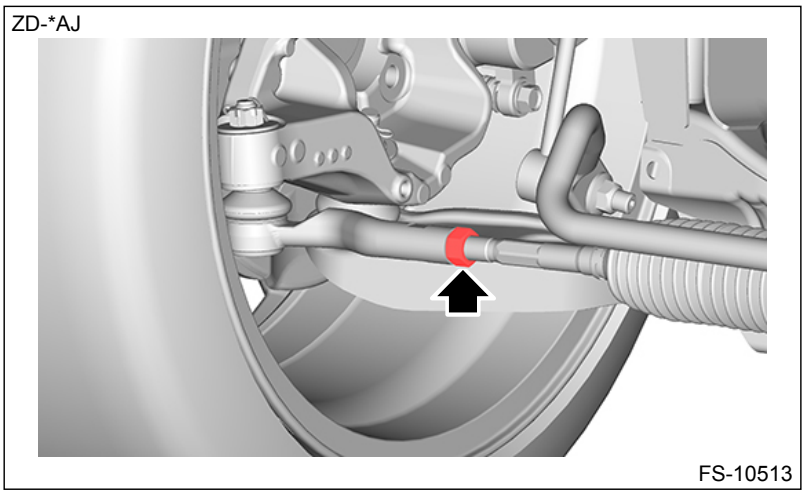
## 3. FRONT TOE-IN

When adjusting the toe-in, adjust it to the following value.

**Toe-in: Adjustment value**

0±2 mm (0±0.08 in)

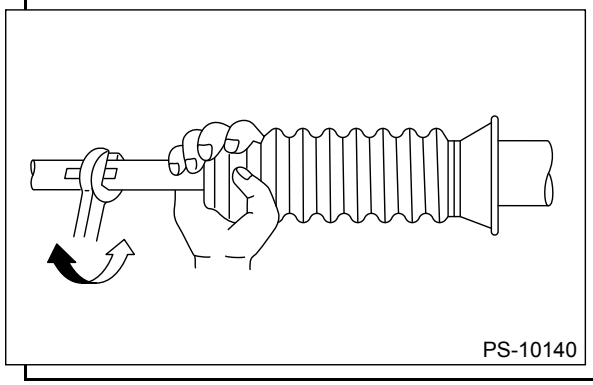
1. Check that the left and right wheel steering angles are within specification.
2. Loosen the tie-rod end lock nuts on the left and right sides.




3. Turn the left and right tie-rods by equal amounts until the toe-in is at the specification.

**Note:**

- **Both the left and right tie-rods are right-hand threaded. To increase toe-in, turn both tie-rods counterclockwise by equal amount (viewing from the inside of vehicle).**
- **When adjusting toe-in, hold the boot steering gearbox as shown to prevent it from being rotated or twisted. If it becomes twisted, straighten it.**




4. Tighten the tie-rod end lock nut.

**Tightening torque:**

85 N·m (8.7 kgf-m, 62.7 ft-lb)

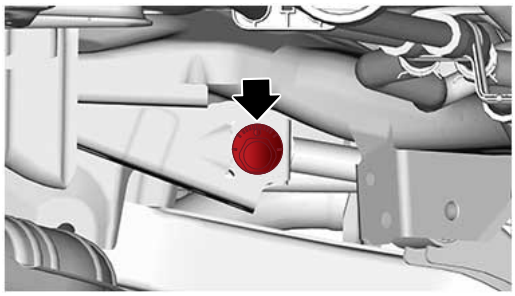
## 4. REAR TOE-IN

When adjusting, adjust it to the following value.

**Toe-in: Adjustment value**

2±2 mm (0.08±0.08 in)

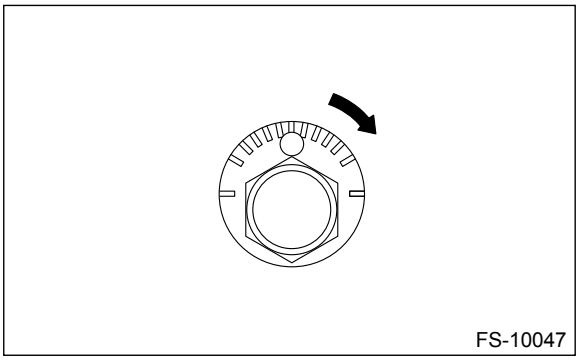
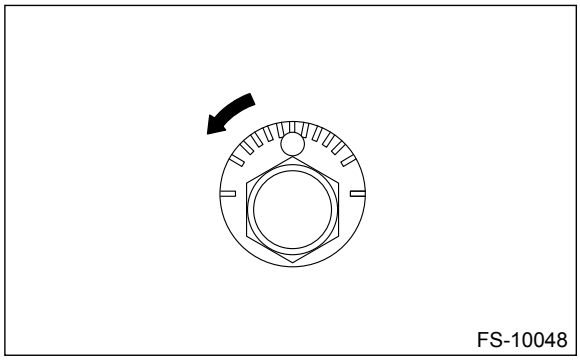
1. Loosen the self-locking nut while holding the bolt side of rear lateral link assembly front.

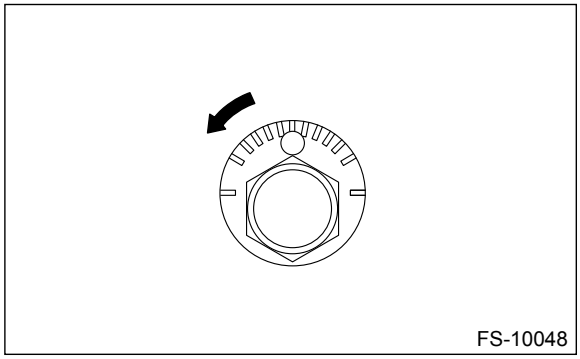
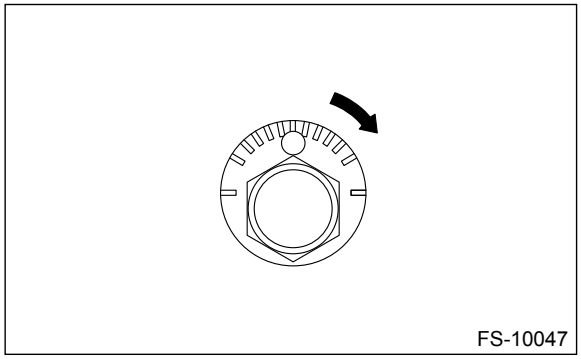

RS-10140

**2.** Turn the adjusting bolt until toe-in is within the specification.

**Note:**

**When the left and right wheels are adjusted for toe-in at the same time, the movement of one scale graduation changes toe-in by approx. 6 mm (0.24 in).**

| To increase toe-in. | |
|---|---|
| Rotate the left side clockwise. | Rotate the right side counterclockwise. |
|  FS-10047 |  FS-10048 |

| To decrease toe-in. | |
|---|---|
| Rotate the left side counterclockwise. | Rotate the right side clockwise. |
|  FS-10048 |  FS-10047 |

**3.** Attach and tighten a new self-locking nut.

**Caution:**

**While holding the bolt side, tighten the nut to the specified torque.**

**Tightening torque:**

100 N·m (10.2 kgf-m, 73.8 ft-lb)

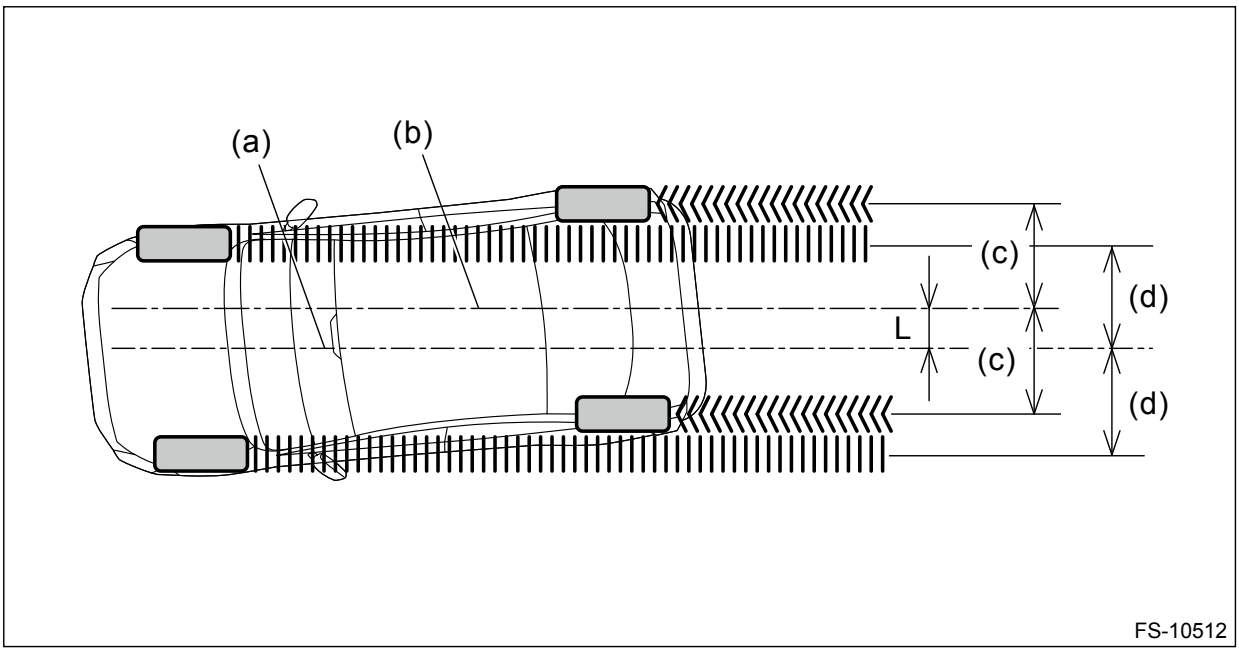
## 5. THRUST ANGLE

When adjusting, adjust it to the following value.

**Thrust angle: Adjustment value**

0°00′±20′

Less than 20′ when "L" is 15 mm (0.6 in) or less.




(a) Center line of loci (front axle) (c) Same distance (d) Same distance

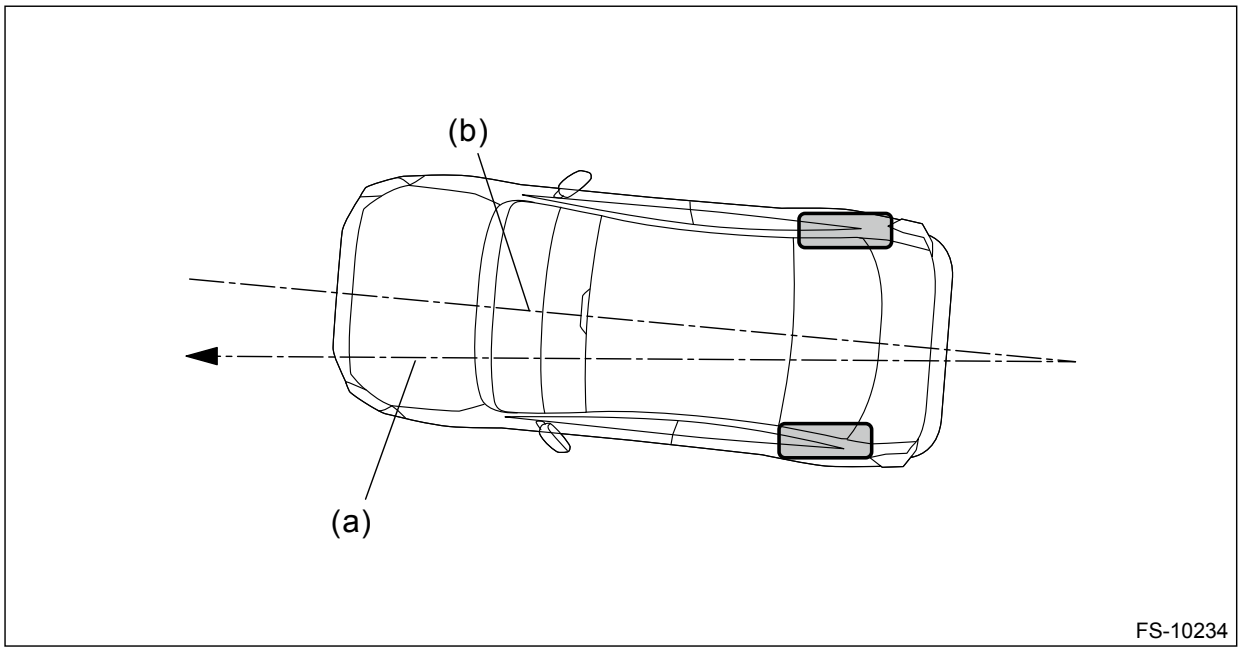
(b) Center line of loci (rear axle)

1. Make thrust angle adjustments by turning the adjusting bolts of the rear suspension equally in the same direction.
2. When one rear tire is adjusted in a toe-in direction, adjust the other rear tire equally in a toe-out direction, in order to make the thrust angle adjustment.
3. When the left and right adjusting bolts are turned by one graduation, the thrust angle will change approx. 15′. ("L" is approx. 11 mm (0.43 in).)

**Note:**

**Thrust angle is a mean value of left and right toe angles in relation to the vehicle body center line.**

**Vehicle is driven straight in the thrust angle direction while slanting in the oblique direction depending on the degree of the mean thrust angle.**




(a) Thrust angle

(b) Body center line

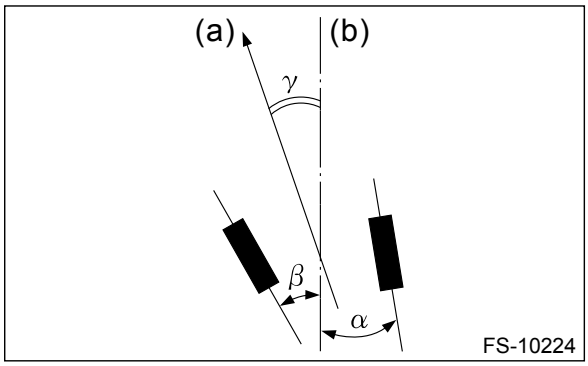
**Thrust angle:**

$\gamma = (\alpha - \beta)/2$

α: Rear RH toe-in angle

β: Rear LH toe-in angle

**Substitute only the positive toe-in values from each tire into α and β in the calculation.**




(a) Front

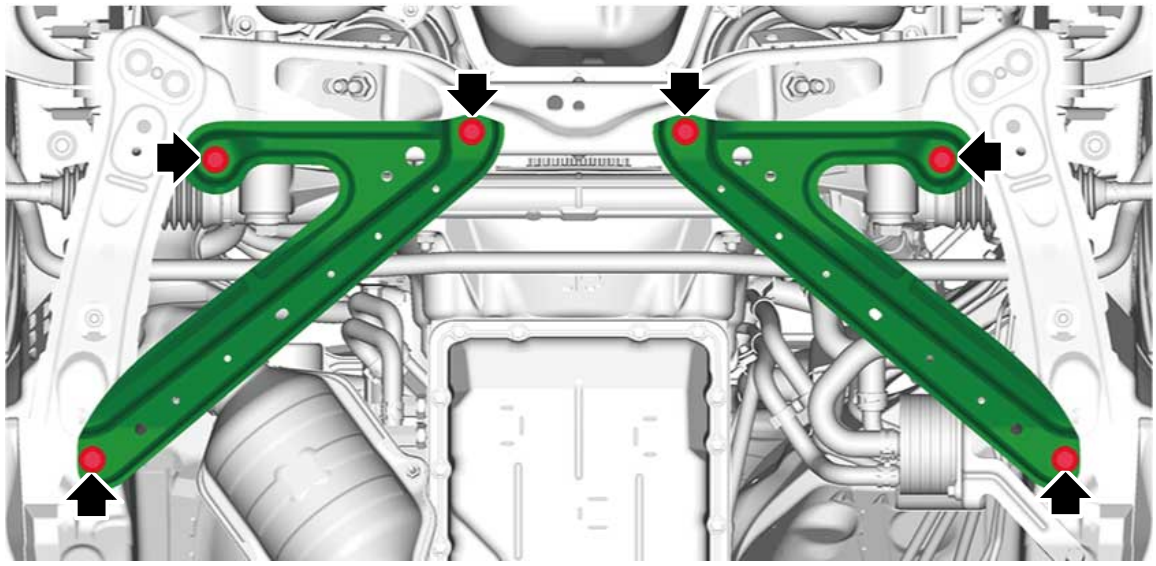
(b) Body center line

## FRONT SUSPENSION > Sub Frame

## REMOVAL

1. Remove the under cover front and the under cover COMPL front T/M. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
2. Remove the bolts, and remove the sub frame front LWR C COMPL.

ZD-*AU



FS-10570

## FRONT SUSPENSION > Sub Frame

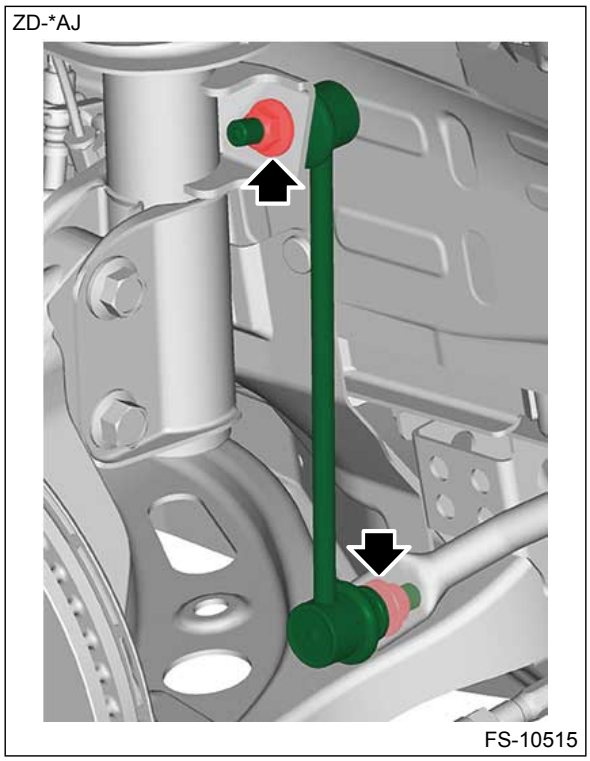
## INSTALLATION

1. Install the sub frame front LWR C COMPL.
   **Tightening torque:**
   70 N·m (7.1 kgf-m, 51.6 ft-lb)
2. Install the under cover COMPL front T/M and the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.

## REMOVAL

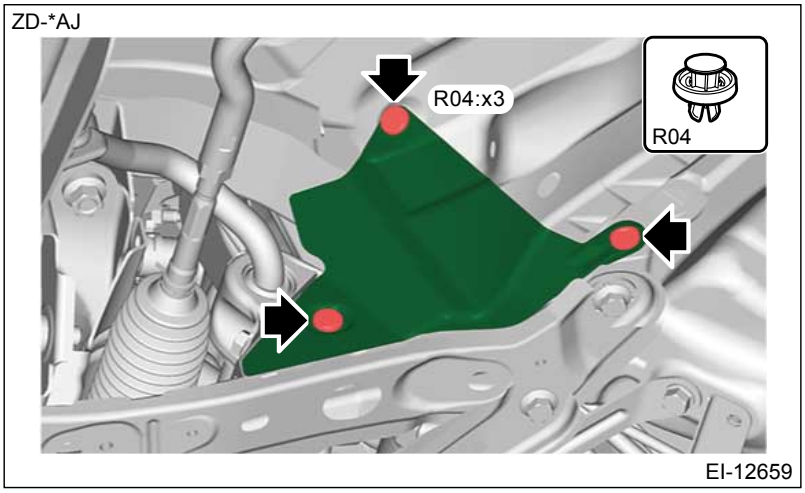
## 1. STABILIZER LINK

1. Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the nut and remove the stabilizer link front.

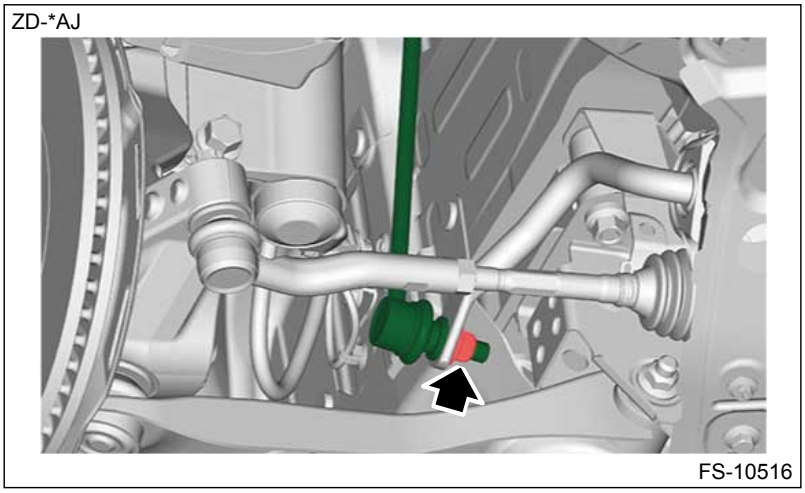



## 2. STABILIZER

1. Remove the under cover front and the under cover COMPL front T/M. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
2. Remove the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>REMOVAL.
3. Remove the clips, and remove the under cover front side rear.

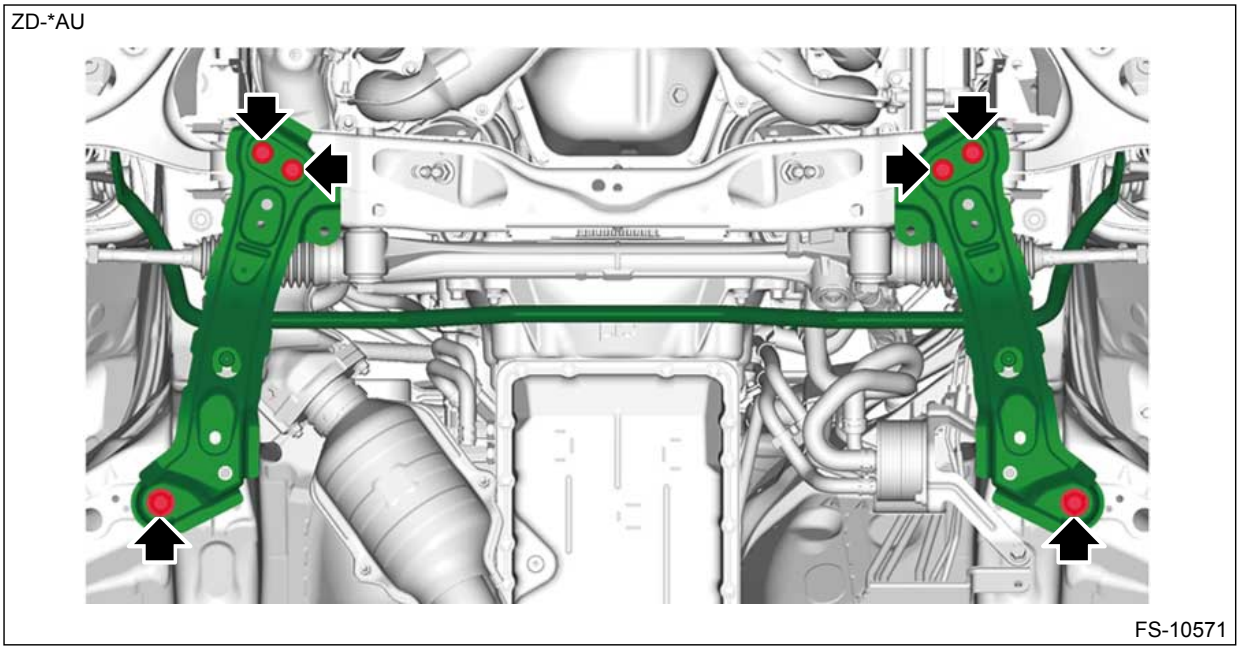



**4.** Remove the nut and disconnect the stabilizer link front (lower part).



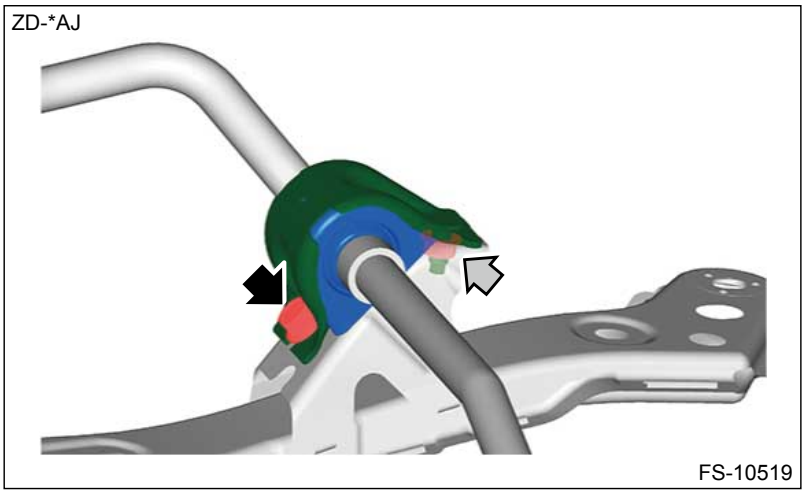

**5.** Remove the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>REMOVAL.

**6.** Remove the bolts, and remove the stabilizer front and the sub frame COMPL as a unit.




**7.** Remove the stabilizer front.

(1) Remove the bolt and nut, and remove the clamp stabilizer.
(2) Remove the rubber bushing stabilizer front.
(3) Remove the stabilizer front.




FRONT SUSPENSION > Stabilizer

## INSTALLATION

### 1. STABILIZER LINK

**Caution:**
**For parts which are not reusable, always use new parts.**

1. Before installation, check the stabilizer link front for damage.
2. Using a new flange nut, install the stabilizer link front.
   **Tightening torque:**
   60 N·m (6.1 kgf-m, 44.3 ft-lb)
3. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

### 2. STABILIZER

**Caution:**
**For parts which are not reusable, always use new parts.**

1. Install the stabilizer front, the rubber bushing stabilizer front, and the clamp stabilizer to the sub frame COMPL.
   **Caution:**
   **Install the rubber bushing stabilizer front with its slit facing the front of the vehicle.**
   **Tightening torque:**
   Nut: 25 N·m (2.5 kgf-m, 18.4 ft-lb)
   Bolt: 75 N·m (7.6 kgf-m, 55.3 ft-lb)
2. Using new flange bolts, install the stabilizer front and the sub frame COMPL as a unit.
   **Tightening torque:**
   60 N·m (6.1 kgf-m, 44.3 ft-lb)

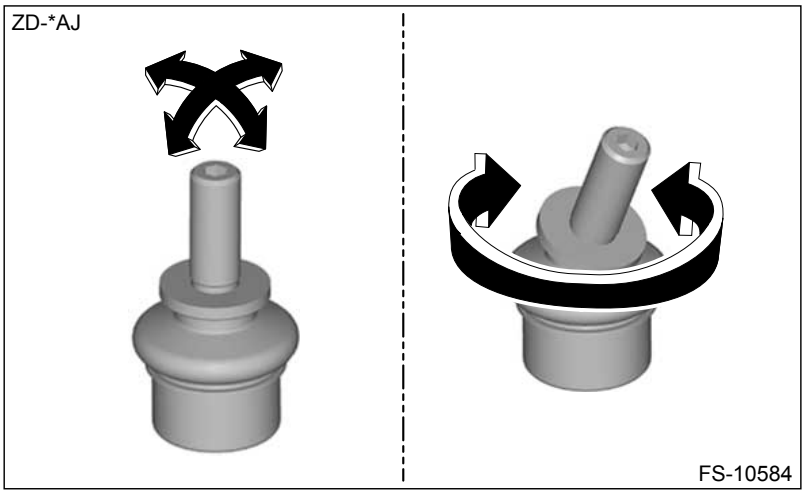
3. Install the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>INSTALLATION.
4. Install the stabilizer link front (bottom part). Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER LINK.
5. Install the under cover front side rear.
6. Install the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>INSTALLATION.
7. Install the under cover COMPL front T/M and the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
8. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
9. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

## FRONT SUSPENSION > Stabilizer

## INSPECTION

### 1. STABILIZER LINK

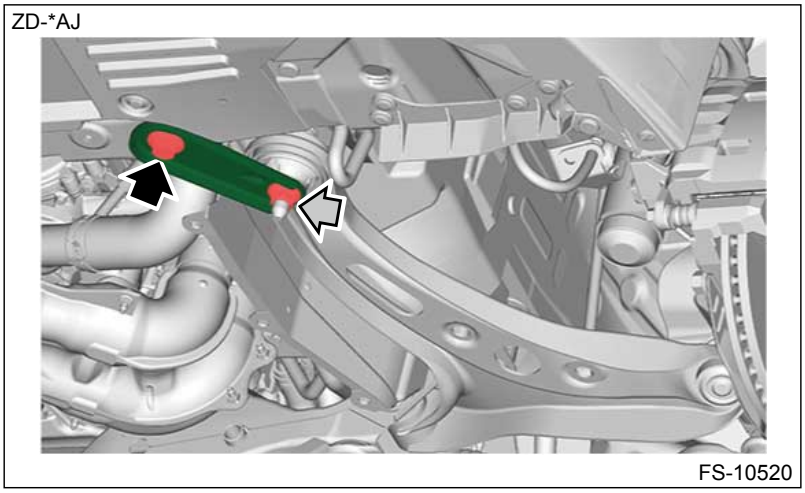
1. Check that there is no deformation, cracks or other damages.
2. Check for excessive rusting.
3. Move the stud as shown in the figure to check that there is no abnormal interference or play.



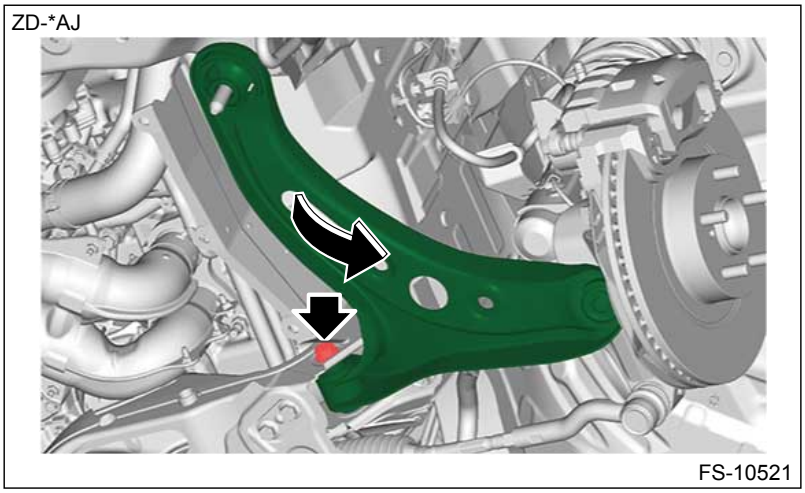

4. If fault is found in the inspection, replace the relevant part.

## REMOVAL


1. Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Disconnect the tie-rod end. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>REMOVAL.
4. Remove the bolt and nut, and remove the plate arm front.




5. Remove the arm assembly front.
   (1) Remove the bolt and nut from the crossmember COMPL front.
   (2) Lower the arm assembly front.



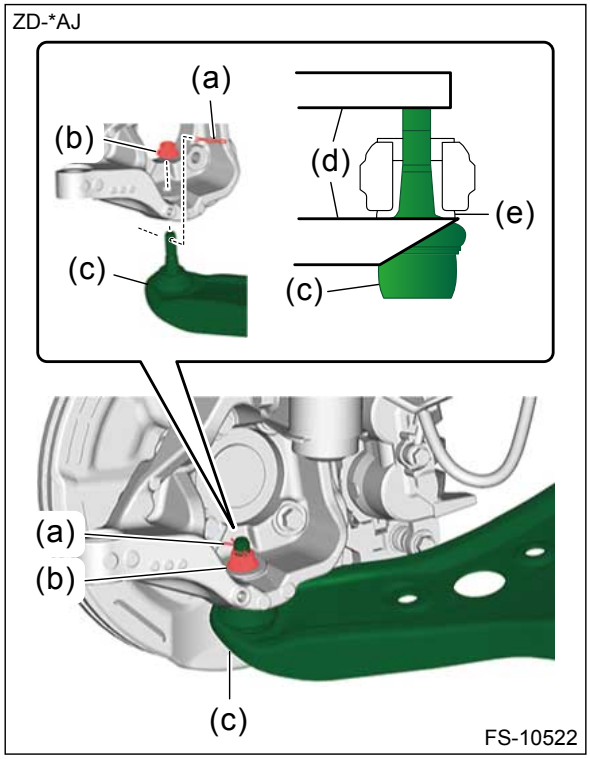

   (3) Remove the snap pin (a).
   (4) Remove the flange nut (b).
   (5) Use a ball joint puller (d) to detach the arm assembly front (c).

**Caution:**

- **Be careful not to damage the boot of the ball joint.**
- **Be careful not to damage the peripheral parts.**

**Note:**

**Securely hook the ball joint puller (d) to the collar (e).**



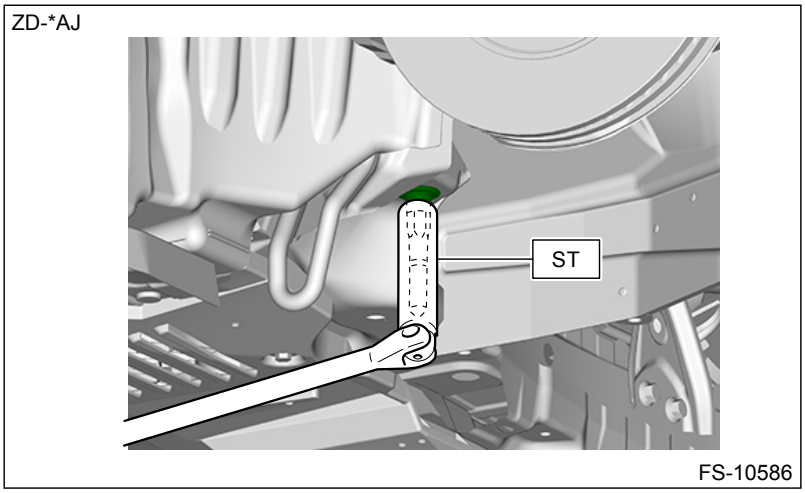

***6.*** Using the ST, remove the stud bolt.

**Note:**

**Perform this procedure only when required.**

**Preparation tool:**

ST: STUD BOLT SOCKET (20299AG020)




## FRONT SUSPENSION > Front Arm

## INSTALLATION

**Caution:**
**For the non-reusable parts, always use new parts.**

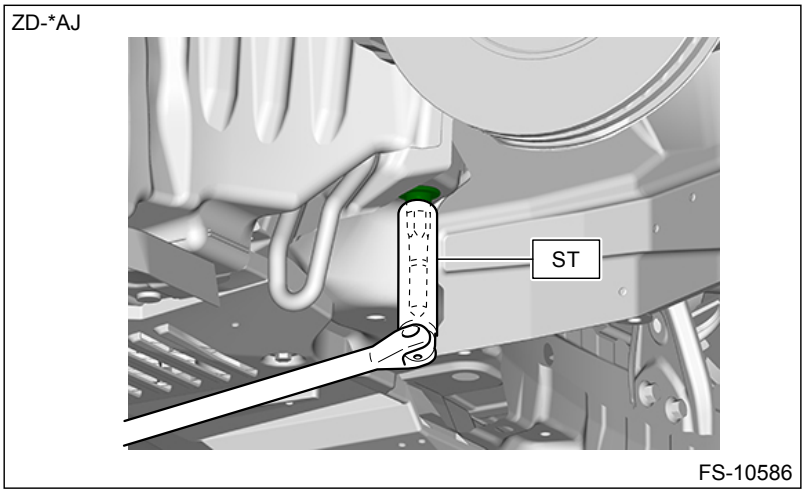
1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Check the arm assembly front for damage or cracks.
   - Check the bushing for abnormal cracks, damage or fatigue.
   - Check the boot on the ball joint for damage.
2. Using the ST, install a new stud bolt.

   **Preparation tool:**

   ST: STUD BOLT SOCKET (20299AG020)

   **Tightening torque:**

   110 N·m (11.2 kgf-m, 81.1 ft-lb)




3. Using the flange nut, install the arm assembly front ball stud to the front axle housing.

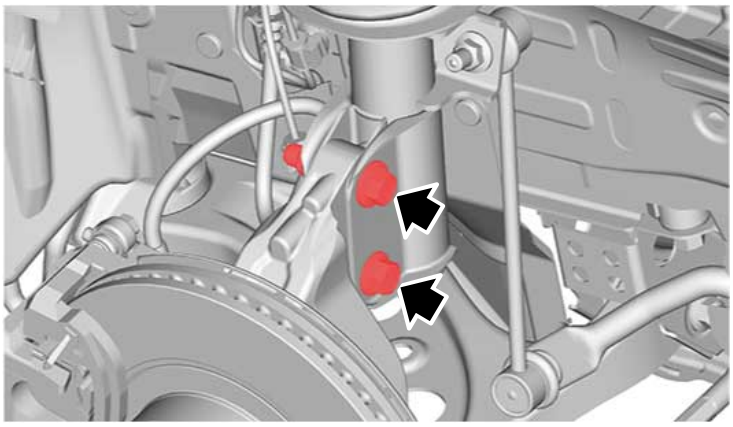
   **Caution:**
   **Be careful not to damage the boot of the ball joint.**

   **Tightening torque:**

   51 N·m (5.2 kgf-m, 37.6 ft-lb)
4. Install a new snap pin.
5. Remove the bolts and nuts, and disconnect the strut assembly and the front axle housing.

   **Caution:**
   **Turn and remove the nut while holding the bolt side.**

ZD-*AJ



FS-10523

**6.** Install the arm assembly front.

(1) Using a bolt and a new self-locking nut, temporary install the arm assembly front.

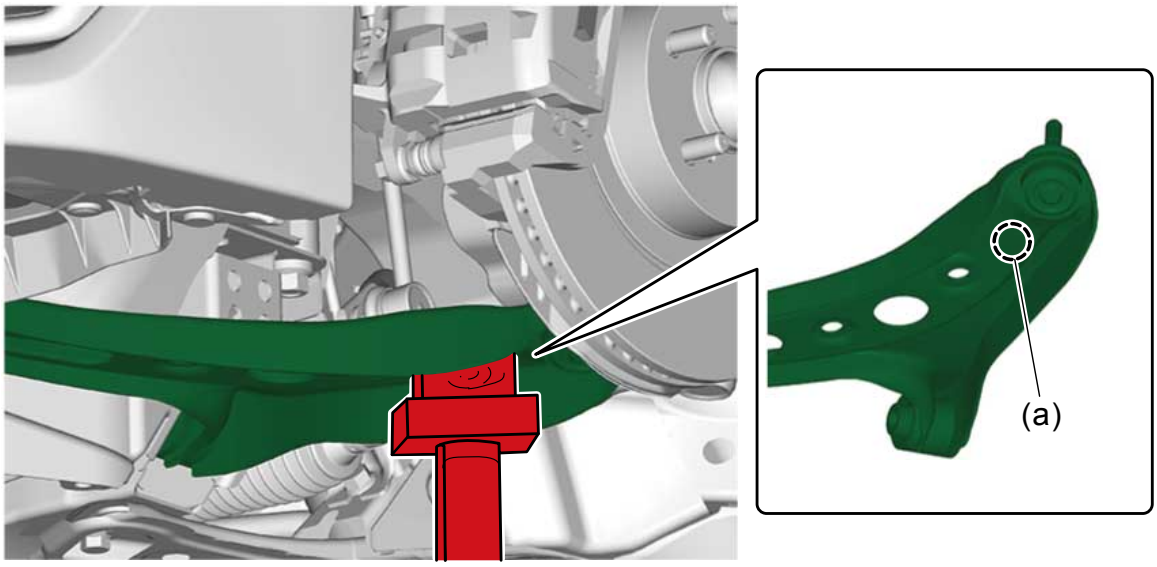
(2) Using a new self-locking nut and a flange bolt, temporarily install the plate arm front.

(3) Set the transmission jack, etc. to (a) position shown in the figure, and apply a load to the arm assembly front.

**Caution:**

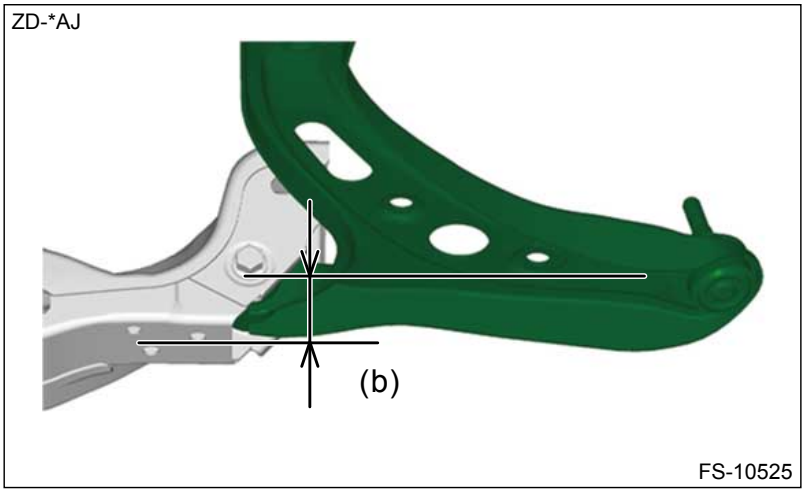
**Do not set the transmission jack to other than position (a) in the figure. Doing so may deform the arm assembly front.**

ZD-*AJ




FS-10524

(4) Adjust the dimensions of the crossmember COMPL front (mounting surface of the sub frame COMPL) and the arm assembly front underside (seating surface against the transmission jack, etc.).




(b) 28 mm (1.1 in)

(5) Tighten the bolts and nuts of the arm assembly front.

**Tightening torque:**

Nut side: 85 N·m (8.7 kgf-m, 62.7 ft-lb)

(6) Tighten the bolts and nuts of the plate arm front.

**Tightening torque:**

Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.

***7.*** Using bolts and new flange nuts, install the strut assembly to the front axle housing.

**Caution:**

**While holding the bolt side, tighten the nut to the specified torque.**

**Tightening torque:**

155 N·m (15.8 kgf-m, 114.3 ft-lb)

***8.*** Connect the tie-rod ends. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>INSTALLATION.

***9.*** Install the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.

***10.*** Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

***11.*** Inspect the wheel alignment and adjust if necessary.

- Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
- Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

***12.*** Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

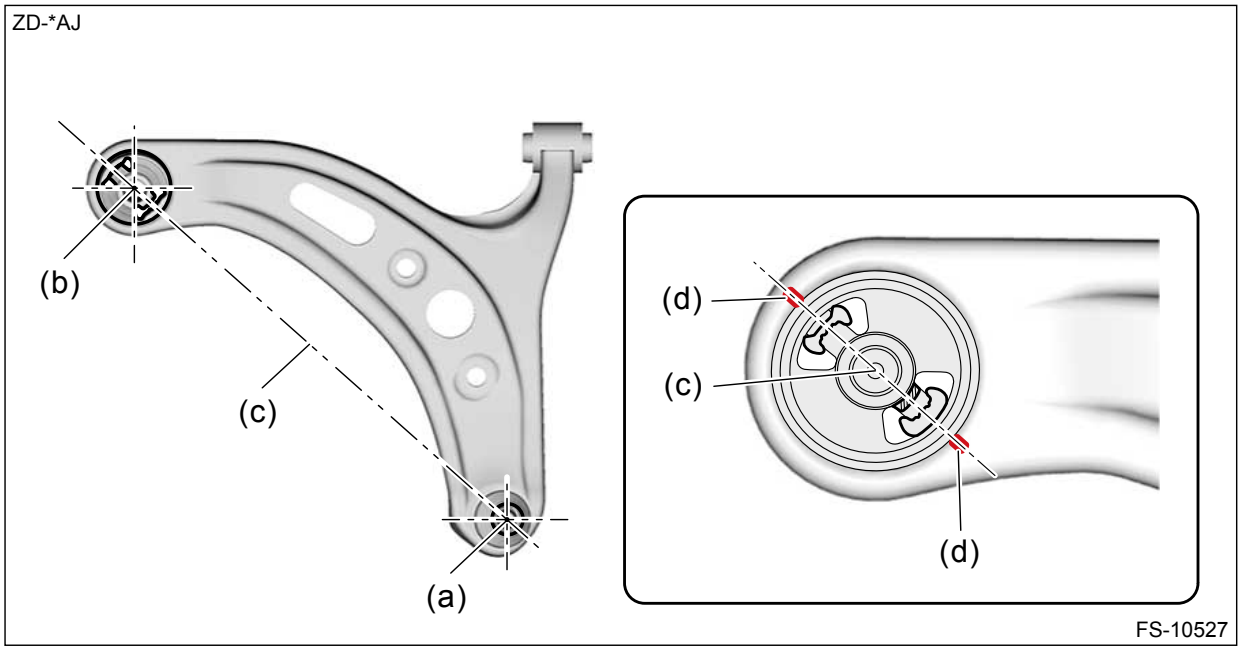
## FRONT SUSPENSION > Front Arm

## DISASSEMBLY

SUBARU SST

## 1. RUBBER BUSHING ARM FRONT

1. Put alignment marks (d) on the arm assembly front, based on an extended line (c) connecting the center of ball joint (a) and the center of rubber busing arm front (b).

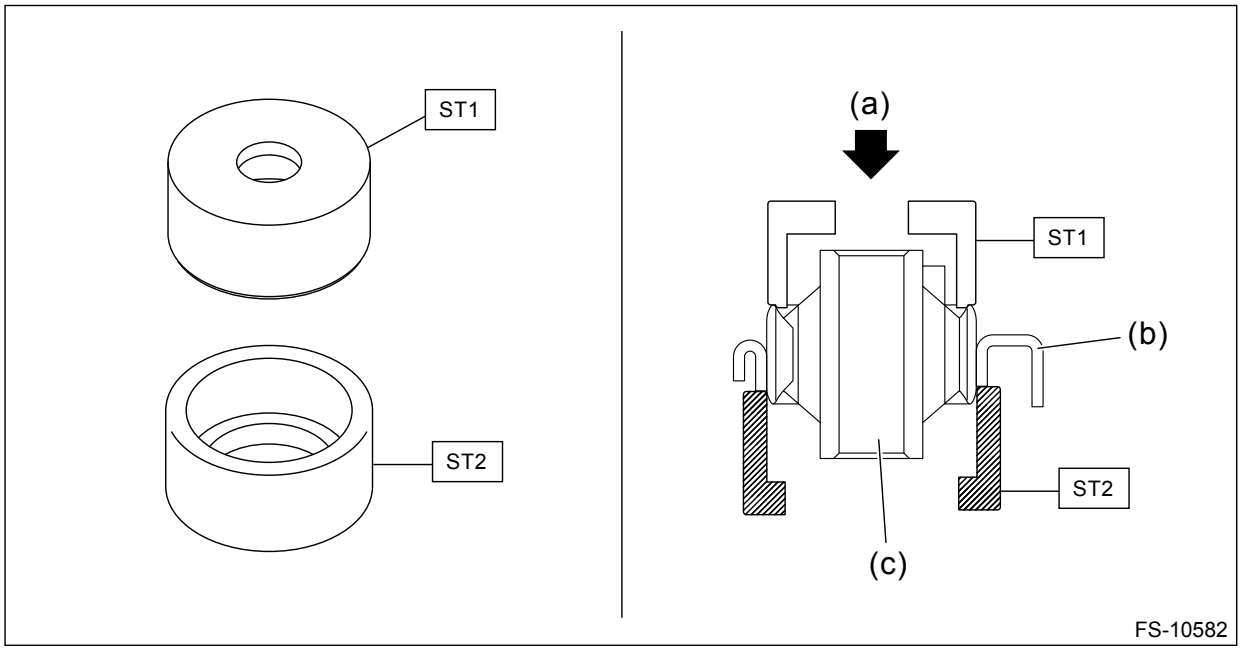



2. Remove the rubber bushing arm front using ST1 and ST2.

**Preparation tool:**

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



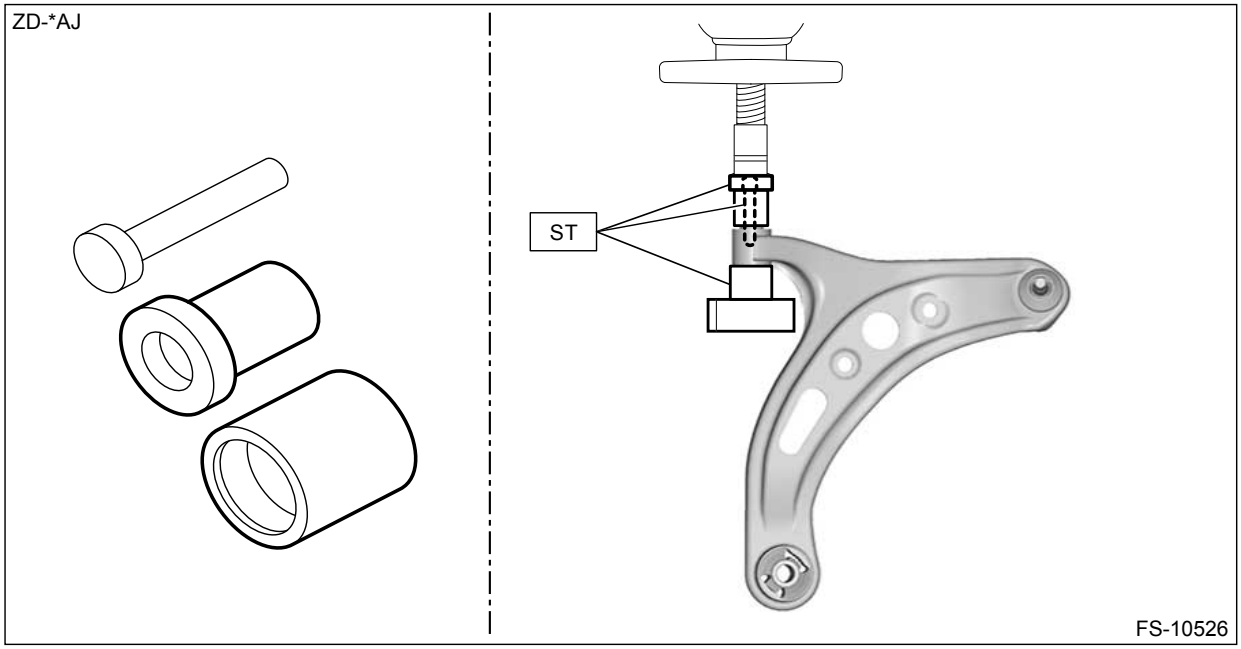

(a) Press (b) Arm ASSY front (c) Rubber bushing arm front

## 2. RUBBER BUSHING ARM REAR

1. Using the ST, remove the rubber bushing arm rear.

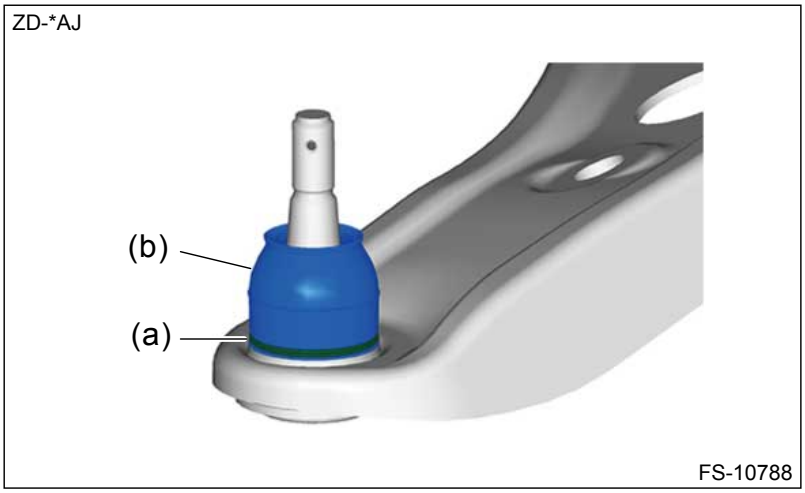
**Preparation tool:**

ST: INSTALLER & REMOVER SET (927680000)



## 3. DUST COVER

1. Remove the dust cover.
   (1) Clean the dirt and foreign matter adhered around the dust cover and its surface.
   (2) Remove the clip (a) from the arm assembly front dust cover.
   (3) Remove the dust cover (b).



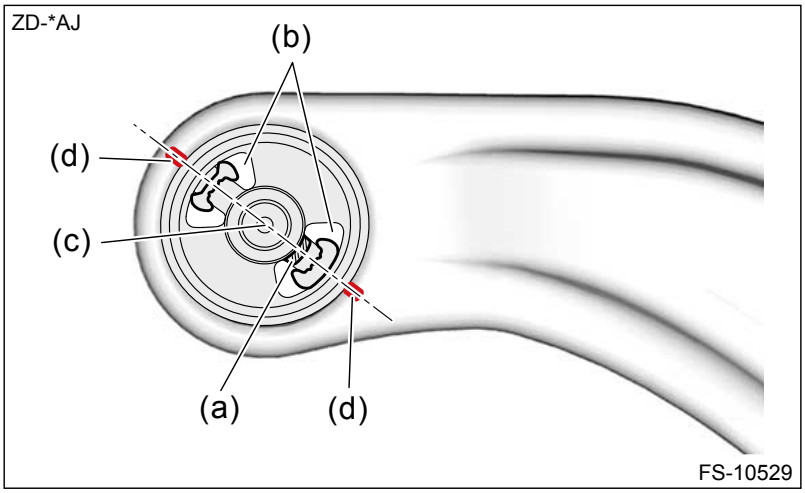

FRONT SUSPENSION > Front Arm

## ASSEMBLY

**Caution:**
**Make sure to press the bushing straight in.**

## 1. RUBBER BUSHING ARM FRONT

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Check the arm assembly front for damage or cracks.
   - Check the bushing for abnormal cracks, damage or fatigue.
   - Check the boot on the ball joint for damage.
2. Place the protrusion (a) of recess section to the ball joint side of the arm assembly front, and then align the line (c) extending from the center of recess section with the alignment marks (d).



(a) Protrusion of the recess section

(b) Recess section

(c) Line extending from the center of recess section

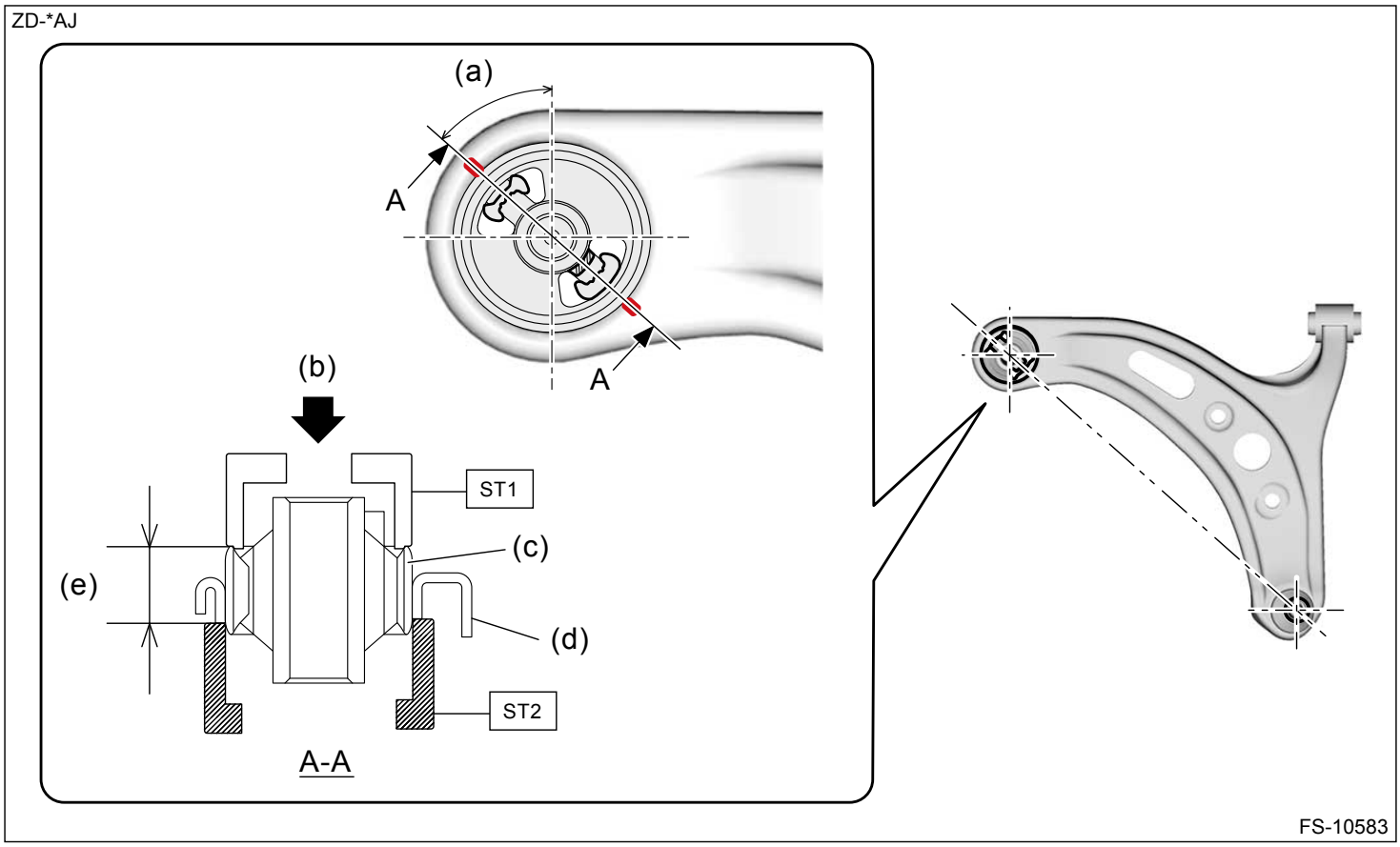
(d) Alignment mark

***3.*** Press-fit the rubber bushing arm front using ST1 and ST2.

**Preparation tool:**

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)




(a) 44° — 50°

(b) Press

(c) Rubber bushing arm front

(d) Arm ASSY front

(e) 25.0 — 26.0 mm (0.98 — 1.02 in)

## 2. RUBBER BUSHING ARM REAR

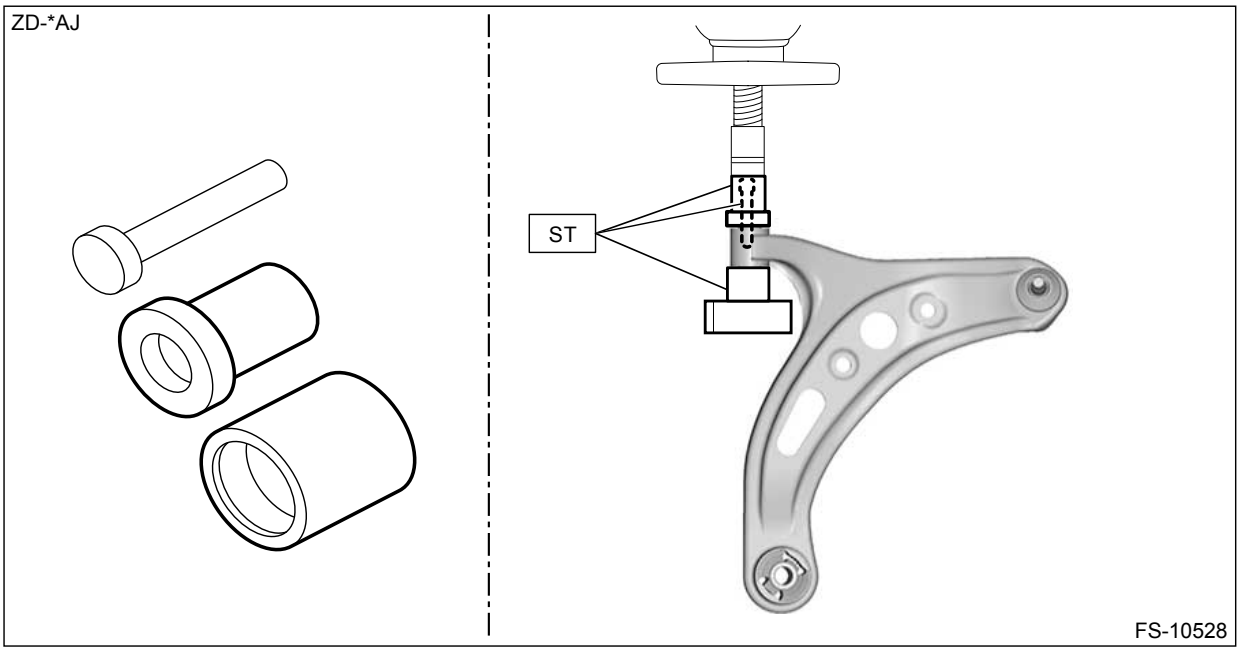
***1.*** Before assembly, inspect the following items and replace any faulty part with a new one.

- Check the arm assembly front for damage or cracks.
- Check the bushing for abnormal cracks, damage or fatigue.
- Check the boot on the ball joint for damage.

***2.*** Using the ST, press-fit the rubber bushing arm rear.

**Preparation tool:**

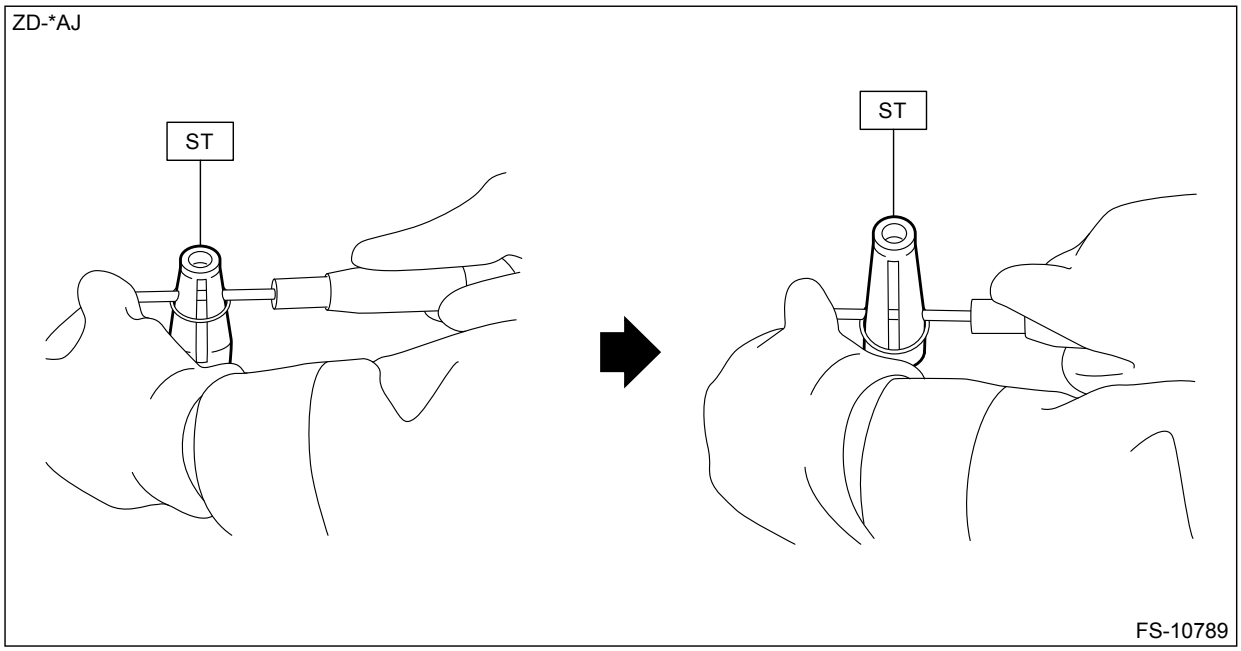
ST: INSTALLER & REMOVER SET (927680000)




## 3. DUST COVER

**Caution:**
**For the non-reusable parts, always use new parts.**

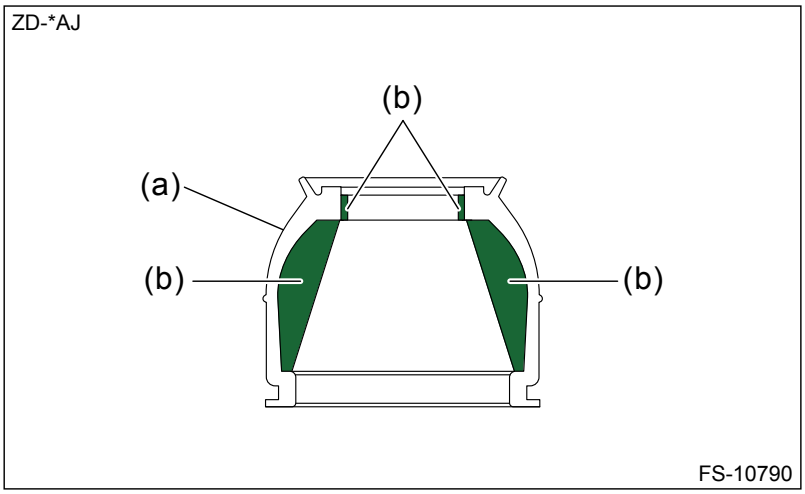
1. Check the grease and ball joint before assembly, and replace the arm assembly front with a new part when necessary.
   - Check if the grease is emulsified (cloudy).
   - Check if the grease turns black or dark brown.
   - Check if rust is found on the concave part and spherical surface of the ball stud.
   - Check if foreign matter like earth and sand enters in the grease.
2. Install the dust cover.
   (1) Install the clips contained in the dust cover repair kit to the ST.
   **Preparation tool:**
   ST: CLIP INSTALLER (20099CA000)




(2) Clean the dirt on the upper part of the ball stud and the dust cover mating groove of the ball joint socket.

**Note:**
**If dust adheres to the inside of the ball joint, remove it by scraping off the grease on the surface.**

(3) Fill the specified grease contained in the dust cover repair kit to the inside of the dust cover, and apply the grease to the rim of the lip.




(a) Dust cover

(b) Specified grease contained in the dust cover repair kit

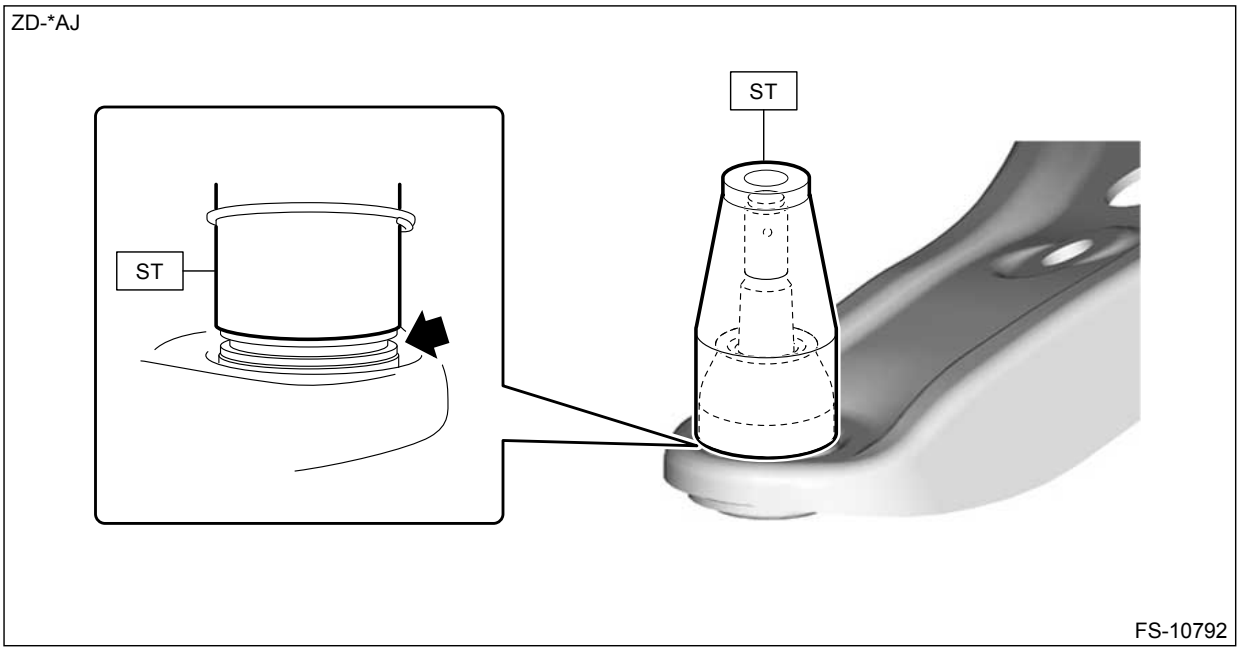
(4) Set the dust cover to the ball joint.

**Caution:**
**Be careful not to damage the dust cover.**


(5) Cover the dust cover with the ST with the clip.

**Note:**

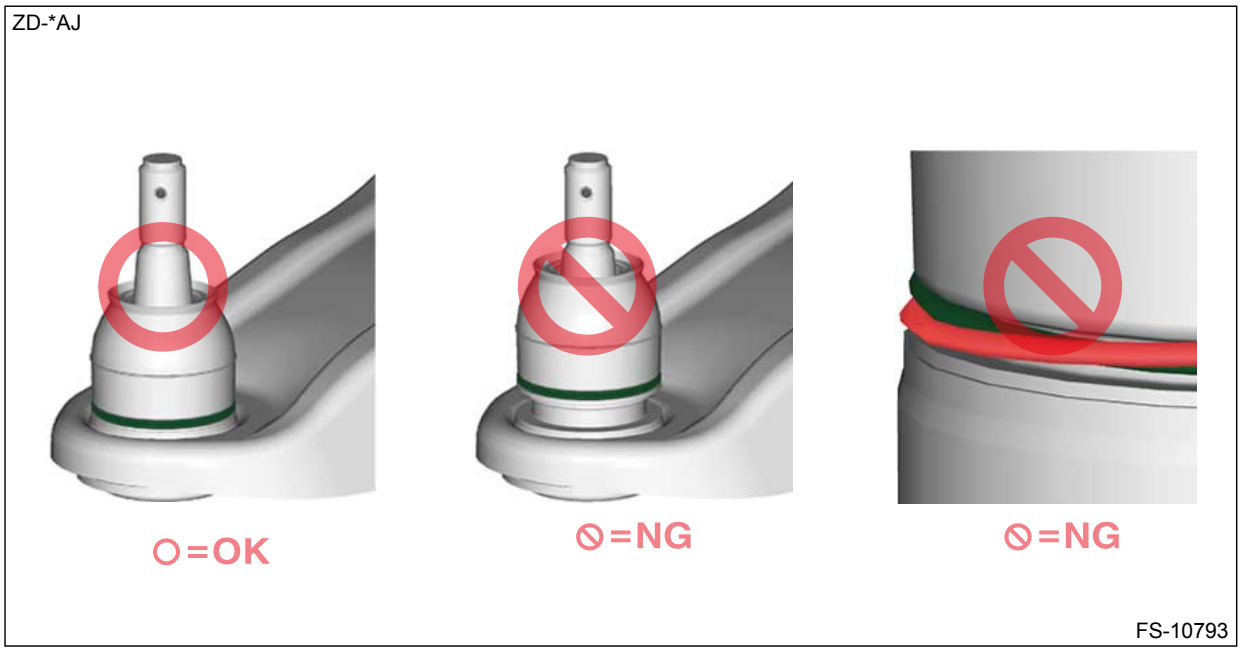
**Check that the clip mounting groove of the dust cover is not covered by the ST.**




(6) Slide the clip from the ST, and attach it to the clip mounting groove on the dust cover.

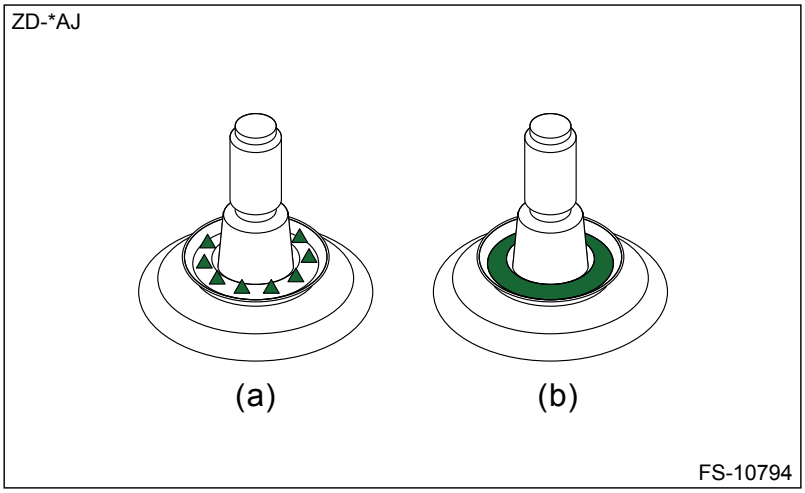
**Note:**

- **Make sure that the dust cover and the ball joint socket are properly installed without gaps.**
- **Make sure that the dust cover has no scratches, damage, or dents on its boot.**
- **Make sure that the clips do not overlap.**




(7) Apply the specified grease contained in the dust cover repair kit to the lip upper surface of the dust cover.

**Note:**
**Either one of the grease application methods (a) and (b) can be applied.**



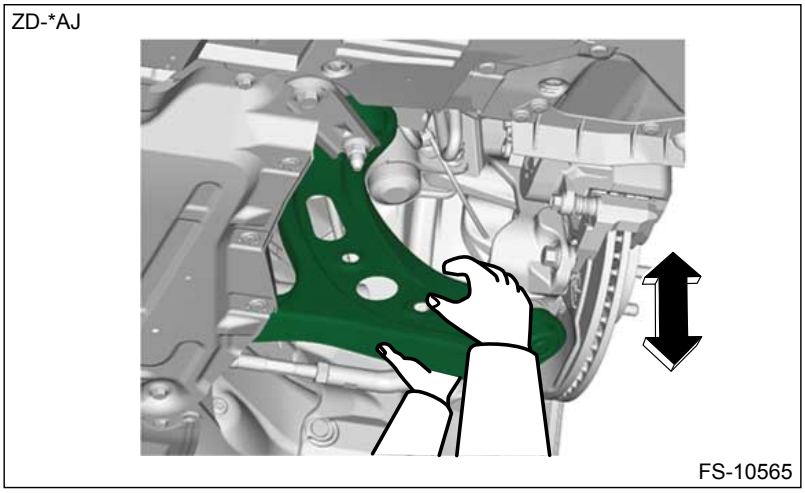

(8) Clean the grease on the thread and the tapered portion of the ball stud.

## FRONT SUSPENSION > Front Arm

## INSPECTION

### 1. ON THE VEHICLE INSPECTION

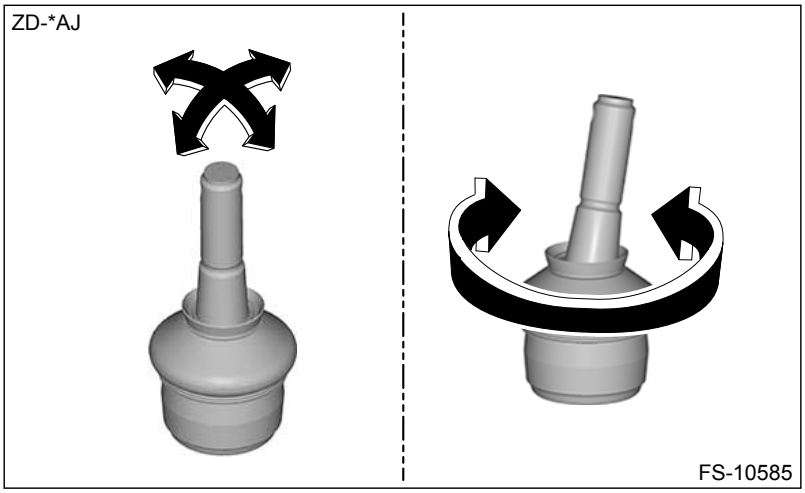
1. Check that there is no deformation, cracks or other damages.
2. Check for excessive rusting.
3. Check the front hub unit bearing for looseness. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSPECTION.
4. Rock the arm assembly front up and down to check the ball joint for looseness.




***5.*** If fault is found in the inspection, replace the relevant part.

## 2. UNIT INSPECTION

***1.*** Move the stud as shown in the figure to check that there is no abnormal interference or play.




***2.*** If fault is found in the inspection, replace the relevant part.

## REMOVAL

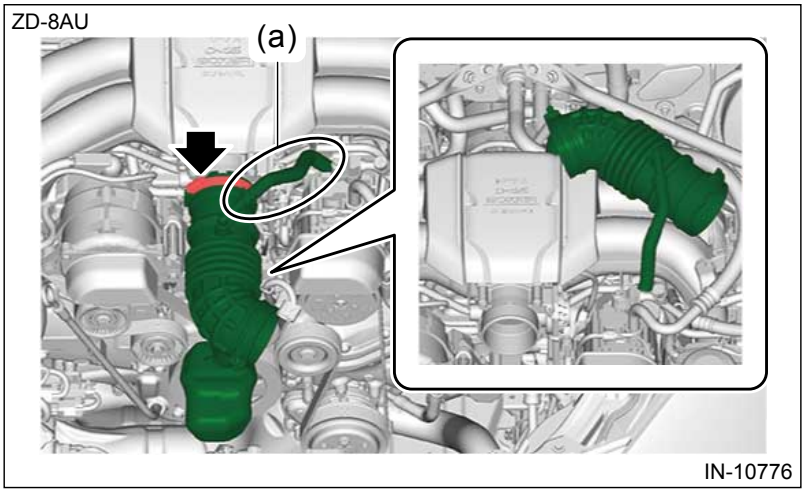

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Fully open the panel COMPL front hood. Ref. to REPAIR CONTENTS>NOTE > STAY ASSEMBLY FRONT HOOD.
3. Perform the steps below to remove the air intake boot, and place it aside so that it does not interfere with the work.

**Caution:**
**Do not disconnect the PCV hose No. 2 (a).**

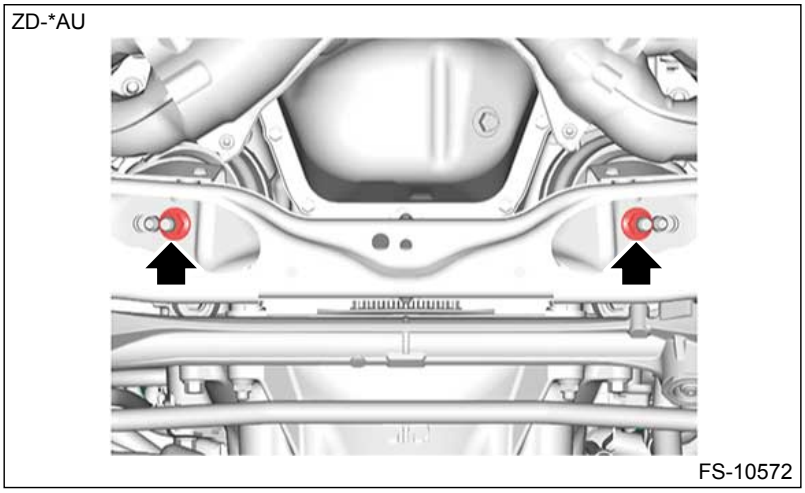
(1) Remove the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>REMOVAL.

(2) Loosen the clamp, remove the air intake boot, and place it aside so that it does not interfere with the work.

**Caution:**
**Be careful not to pull out the PCV hose No. 2 (a).**



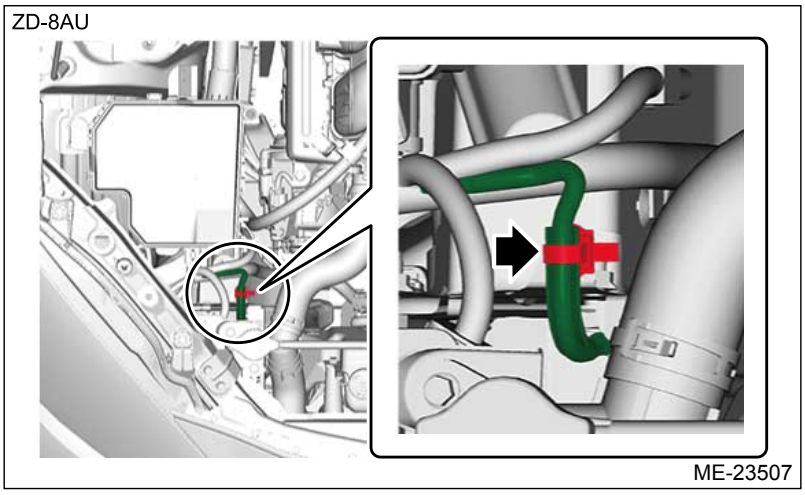

4. Remove the under cover front and the under cover COMPL front T/M. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
5. Remove the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>REMOVAL.
6. Remove the nuts which secure the engine mounting to the crossmember COMPL front.



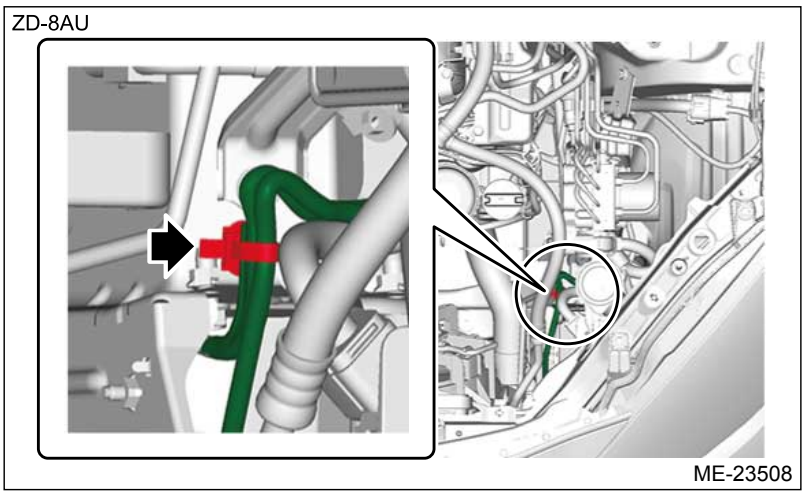

***7.*** Remove the clip securing the bulkhead wiring harness to the vehicle.

**Note:**
**This procedure is required to prevent the bulkhead wiring harness from being damaged by the adjuster (ST).**

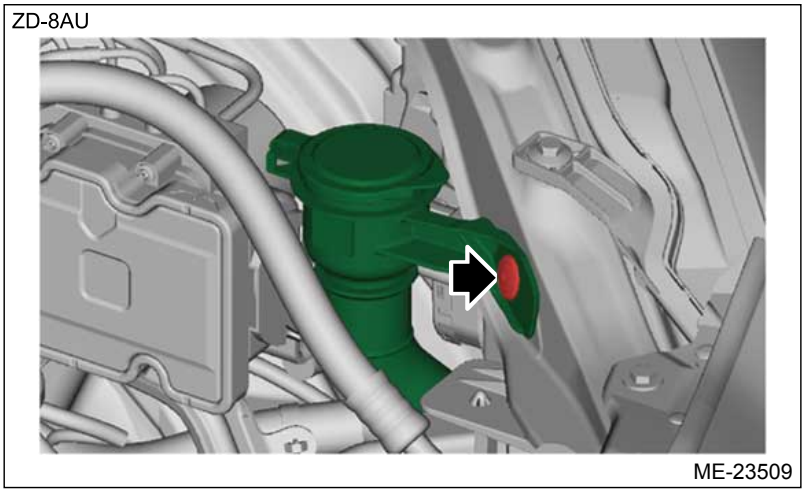
- RH side




- LH side




***8.*** Remove clip securing the hose inlet assembly.




***9.*** Support the engine using ST1, ST2, ST3, ST4 and the shackle.

(1) Using the ST1, install the ST2 to the engine unit.

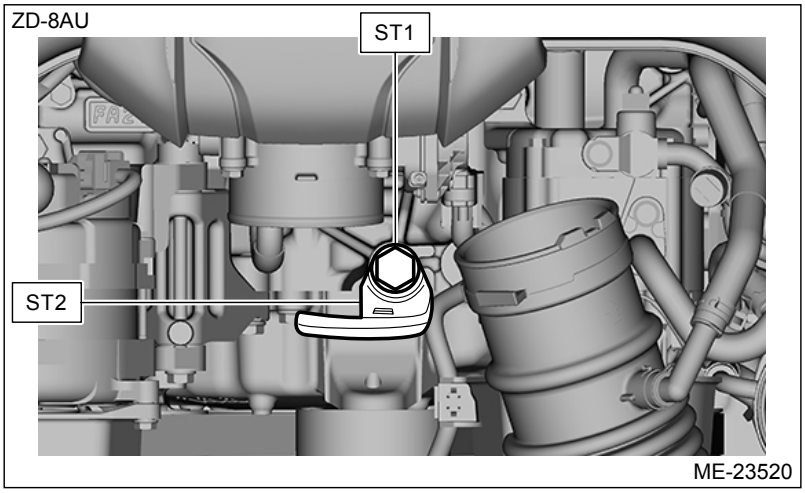
**Preparation tool:**

ST1: BOLT (90119-14120)

ST2: ENGINE HANGER NO.1 (12281-38150)

**Tightening torque:**

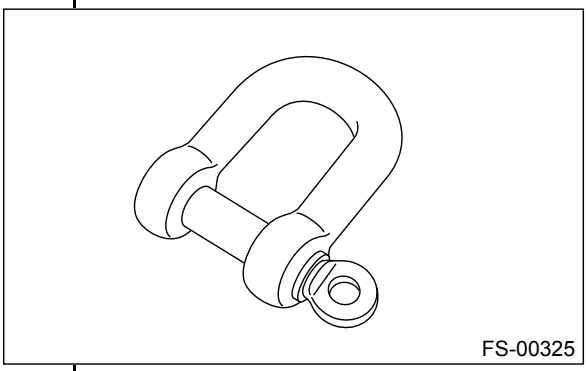
43 N·m (4.4 kgf-m, 31.7 ft-lb)




(2) Set the ST3, ST4, and the shackle to the vehicle.

**Caution:**

- **Use a shackle with the load capacity of 250 kg (551 lb) or more.**




- **Set the ST3, ST4, and the shackle at the locations shown in the figure.**

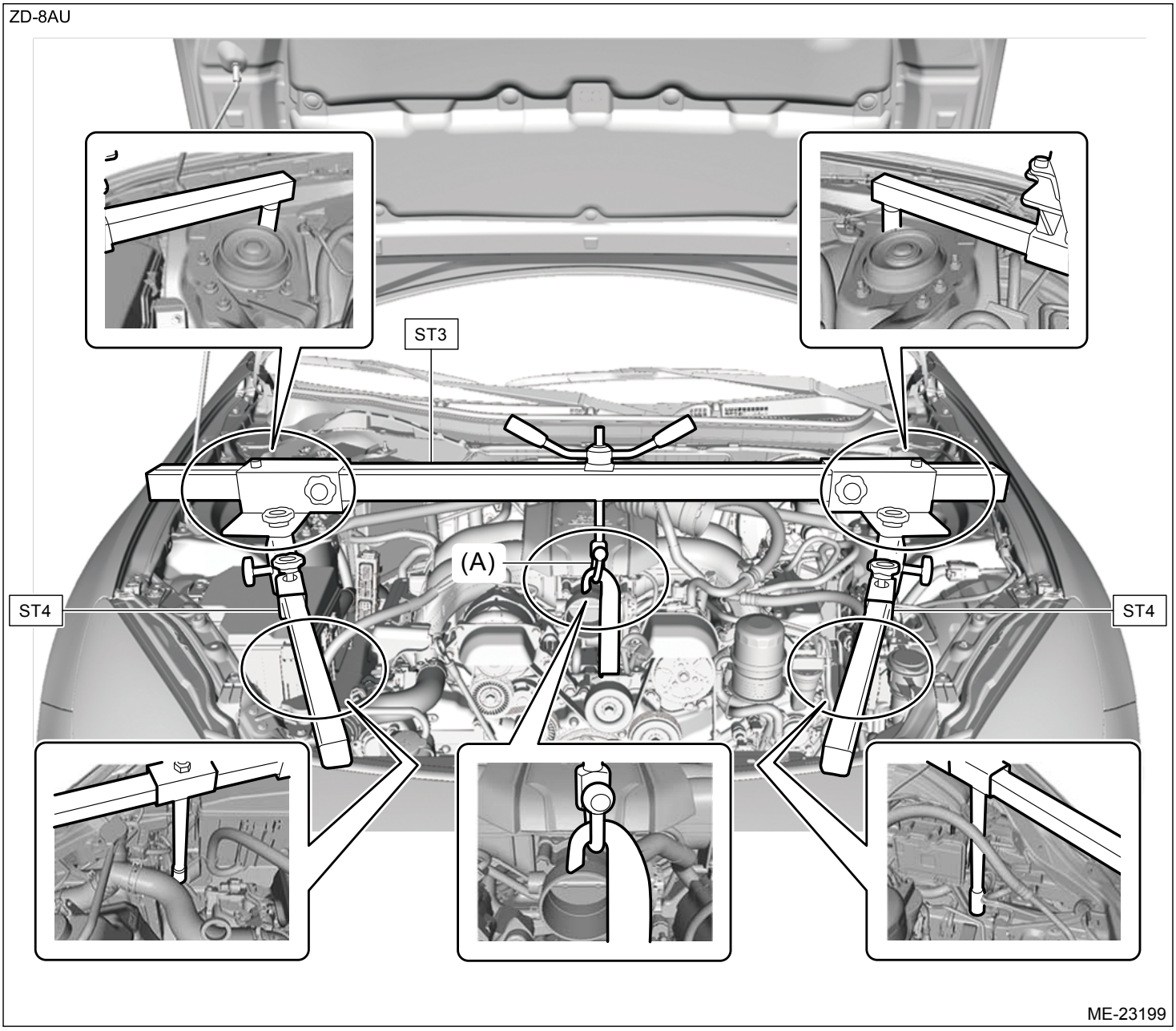
**Preparation tool:**

ST3: ENGINE HANGER (99099AJ000)

ST4: ADJUSTER (18679AA020)

**General tool:**

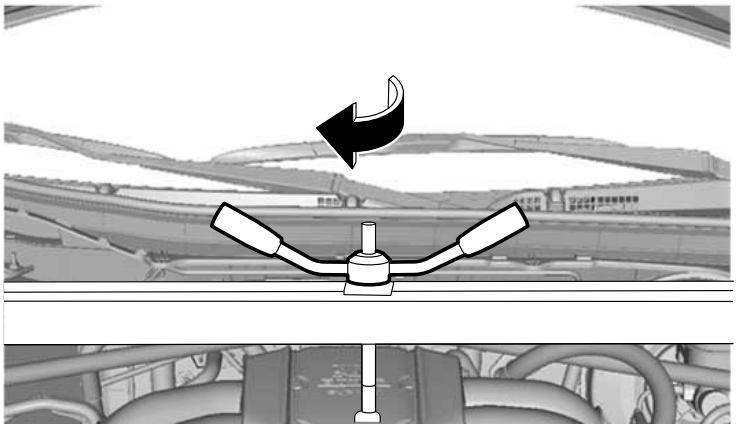
Shackle




(A) Shackle

(3) Turn the steering wheel clockwise and lift the engine gradually to support it.

ZD-8AU



ME-23512

**10.** Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.

**11.** Remove the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>REMOVAL.

**12.** Remove the stabilizer front and the sub frame COMPL as a unit. Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL > STABILIZER.

**13.** Disconnect the tie-rod end. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>REMOVAL.

**14.** Remove the arm assembly front. Ref. to FRONT SUSPENSION>Front Arm>REMOVAL.

**15.** Disconnect the lower side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

**16.** Remove the steering gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>REMOVAL.

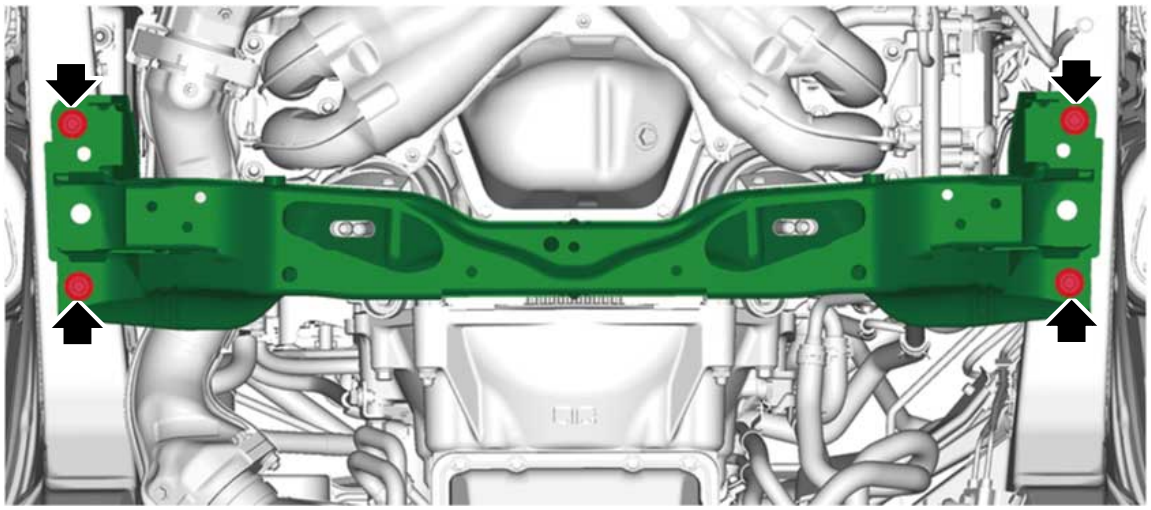
**17.** Remove the crossmember COMPL front.

**Note:**
**Since the crossmember is heavy, make sure that it is firmly supported so that it is level.**

(1) Support the crossmember COMPL front from the bottom side using a transmission jack.

(2) Remove the bolts which secure the crossmember COMPL front to the body.

ZD-*AU



FS-10573

(3) Lower the transmission jack slowly, and lower the crossmember COMPL front.

## FRONT SUSPENSION > Crossmember

## INSTALLATION

**Caution:**

- **For the non-reusable parts, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

***1.*** Install the crossmember COMPL front.

**Note:**

- **Check the crossmember for damage or cracks, and correct or replace if defective.**
- **Since the crossmember is heavy, make sure that it is firmly supported so that it is level.**

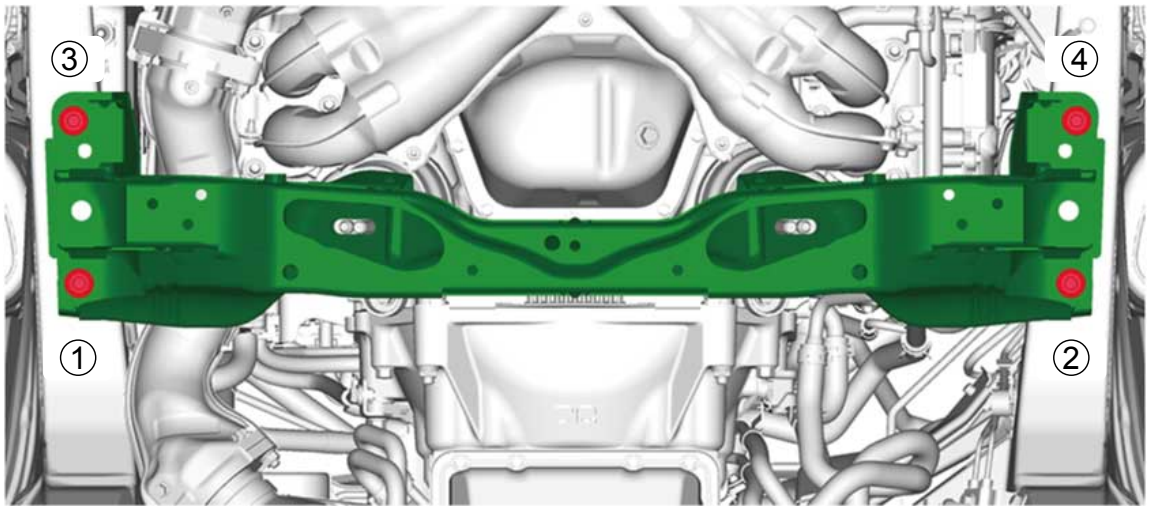
(1) Using new flange bolts, temporarily install the crossmember COMPL front.

(2) Tighten the bolts in the numerical order as shown in the figure.

**Tightening torque:**

95 N·m (9.7 kgf-m, 70.1 ft-lb)

ZD-*AU

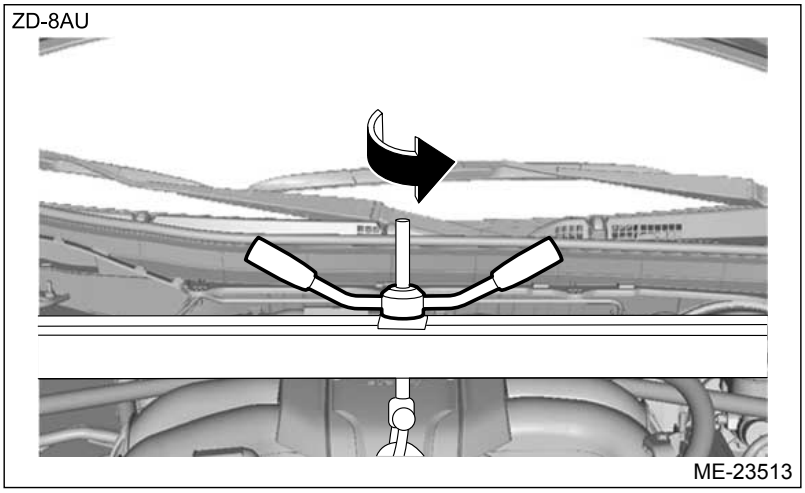



FS-10581

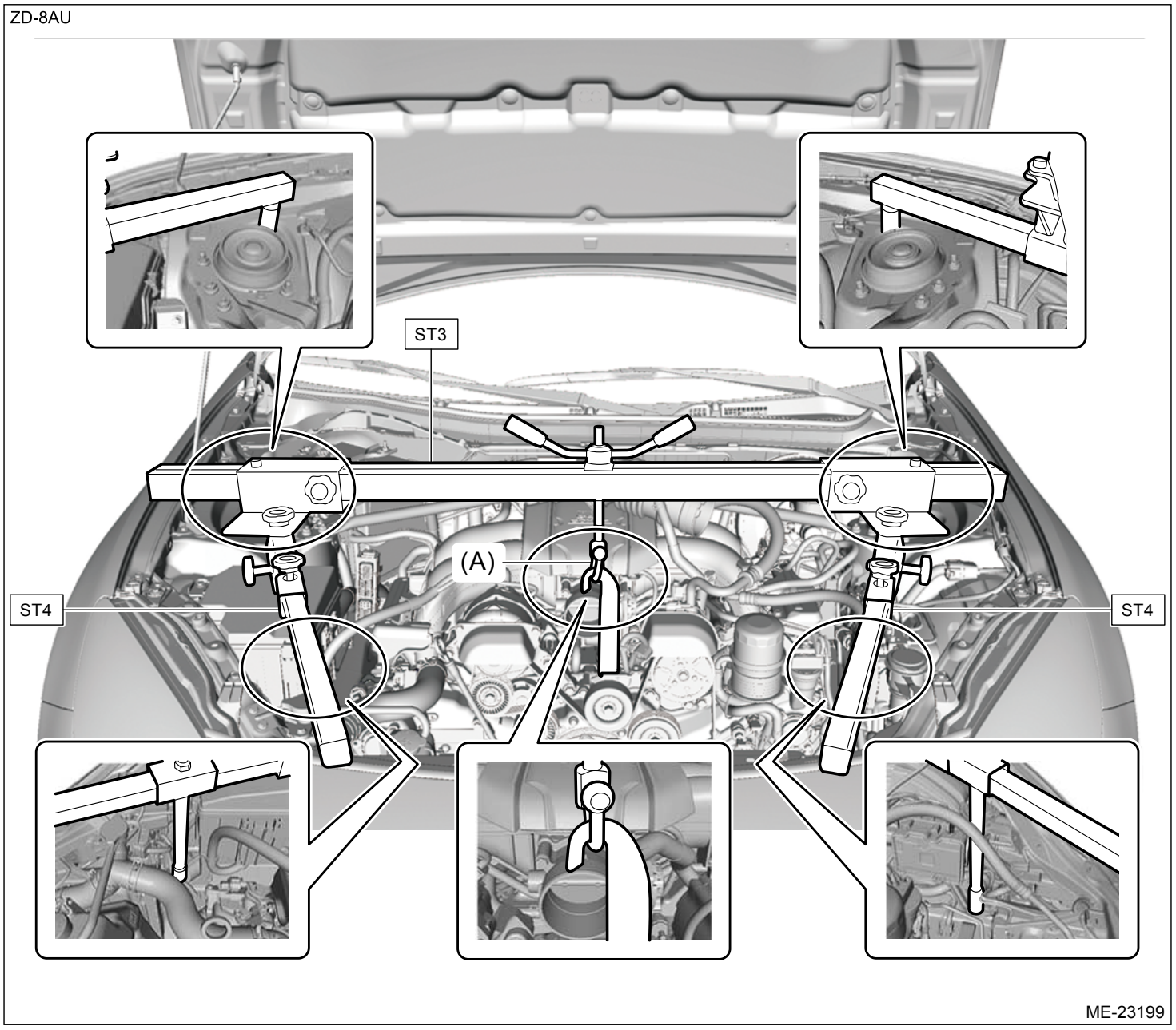
***2.*** Turn the handle counterclockwise to lower the engine gradually and insert the stud bolt of the engine mounting into the engine mounting hole of the crossmember COMPL front.

**Note:**

- **If it is hard to insert the stud bolt of the engine mounting into the engine mounting hole of the crossmember COMPL front, lower the engine while lightly pushing it toward the rear of the vehicle.**
- **Check that the stud bolt of the engine mounting is securely inserted into the engine mounting hole of the crossmember COMPL front.**

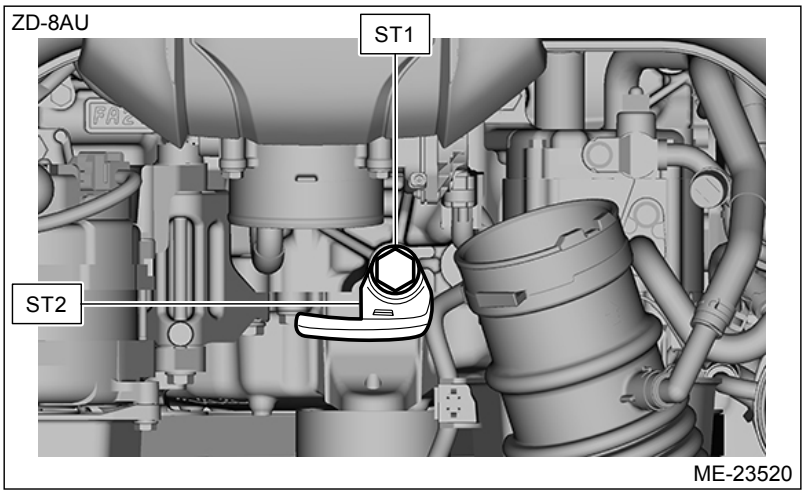



***3.*** Remove the ST3, ST4, and the shackle from the vehicle.



(A) Shackle

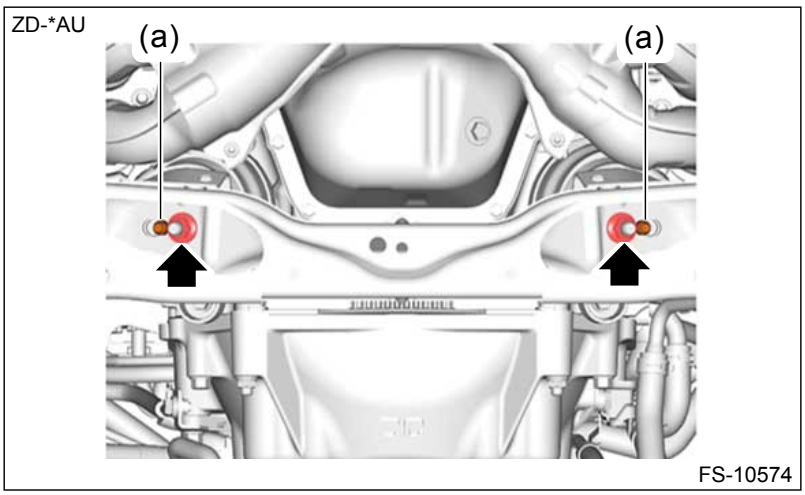
4. Remove the ST1 and ST2.




5. Install the engine mounting and the crossmember COMPL front with new nuts.

**Note:**
**Make sure that locators (a) of the engine mounting are securely inserted.**

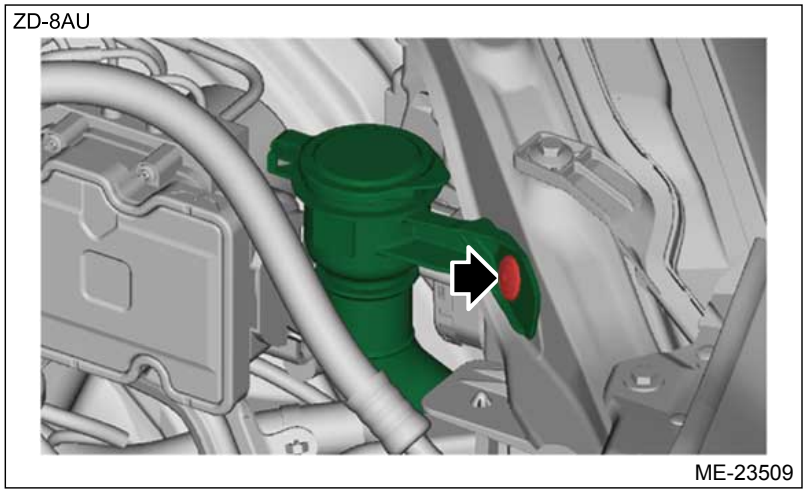
**Tightening torque:**
90 N·m (9.2 kgf-m, 66.4 ft-lb)



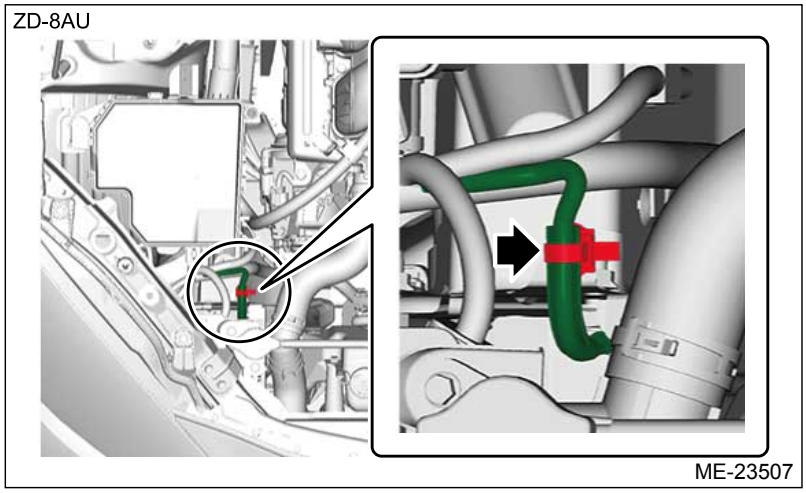

6. Install the steering gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Gearbox>INSTALLATION.
7. Connect the lower side of the universal joint assembly steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
8. Install the arm assembly front. Ref. to FRONT SUSPENSION>Front Arm>INSTALLATION.
9. Connect the tie-rod ends. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Tie-rod end>INSTALLATION.
10. Install the stabilizer front and the sub frame COMPL as a unit. Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER.
11. Install the sub frame front LWR C COMPL. Ref. to FRONT SUSPENSION>Sub Frame>INSTALLATION.
12. Install the under cover rear. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under

Protector>INSTALLATION.

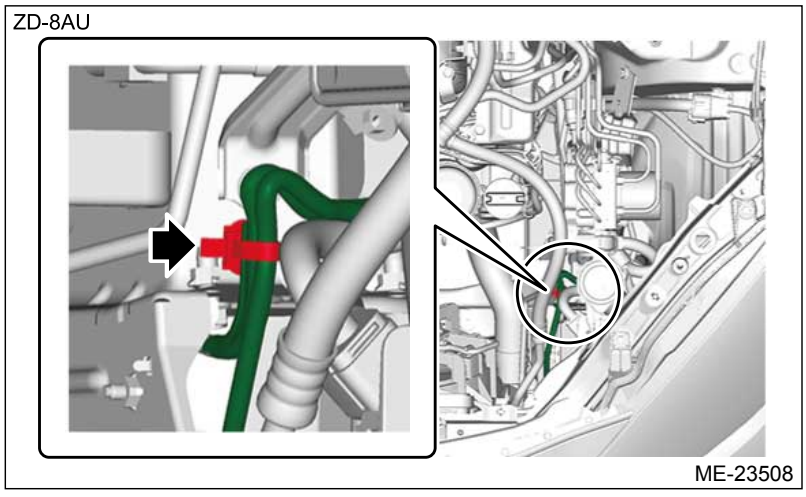
13. Install the under cover COMPL front T/M and the under cover front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
14. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
15. Secure the hose inlet assembly to the vehicle with the clip.




16. Secure the bulkhead wiring harness to the vehicle with the clip.
    - RH side




    - LH side



17. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
18. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
19. Set the panel COMPL front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > STAY ASSEMBLY FRONT HOOD.
20. Check the select lever and adjust it if necessary. (AT model)

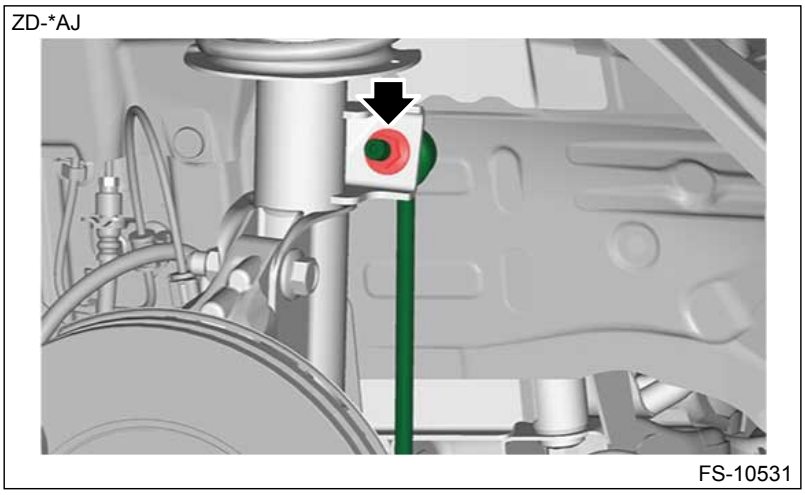
**Note:**
**This procedure is required because the select lever may be deviated from the adjusted position due to installation/removal of the nut on the engine mounting.**

- Inspection: Ref. to CONTROL SYSTEMS>Select Lever>INSPECTION.
- Adjustment: Ref. to CONTROL SYSTEMS>Select Lever>ADJUSTMENT.

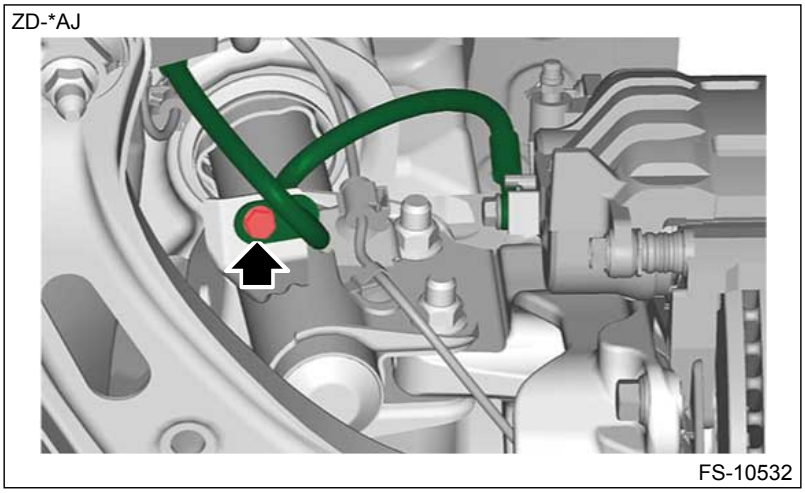
21. Inspect the wheel alignment and adjust if necessary.
    - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
    - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
22. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

## REMOVAL

1. Remove the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the nut and disconnect the stabilizer link front (upper part).

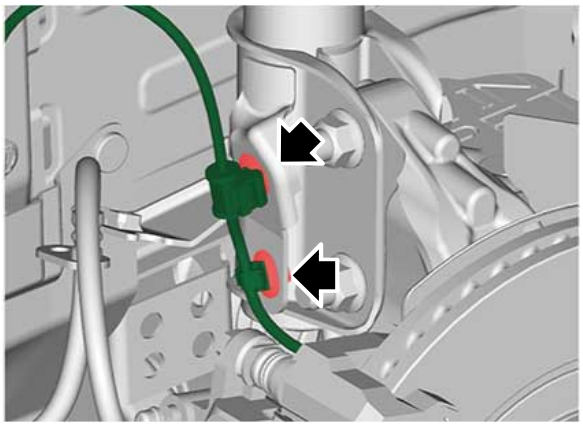



3. Remove the bolt and then remove the brake hose bracket.




4. Remove the harness clips of the sensor sub assembly front.

ZD-*AJ



FS-10533

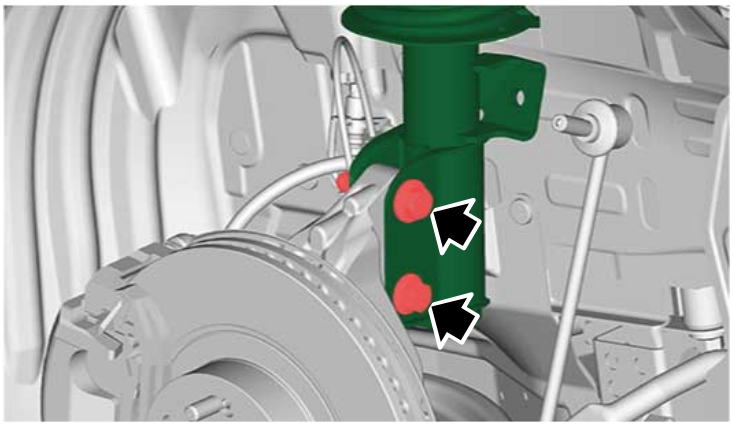
**5.** Remove the strut assembly.

(1) Remove the bolts and nuts of the strut assembly.

**Caution:**

**Turn and remove the nut while holding the bolt side.**

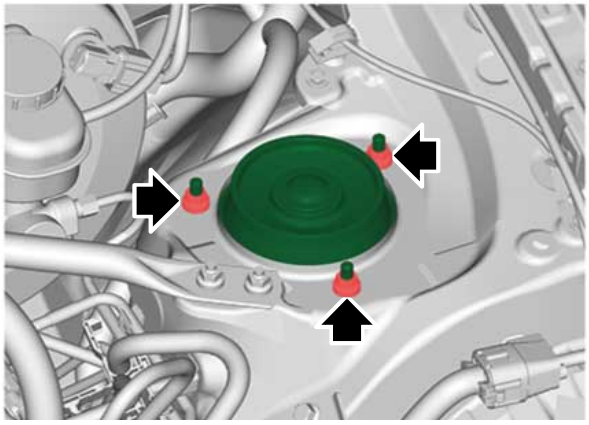
ZD-*AJ



FS-10534

(2) Remove the nuts, and remove the strut assembly.

ZD-*AU



FS-10575

## INSTALLATION

**Caution:**
**For parts which are not reusable, always use new parts.**

1. Install the strut assembly.
   (1) Install the upper side of the strut assembly with new flange nuts.
   **Tightening torque:**
   23 N·m (2.3 kgf-m, 17.0 ft-lb)
   (2) Using bolts and new flange nuts, install the strut assembly to the front axle housing.
   **Caution:**
   - **Insert the bolts from the rear of the vehicle.**
   - **While holding the bolt side, tighten the nut to the specified torque.**

   **Tightening torque:**
   155 N·m (15.8 kgf-m, 114.3 ft-lb)
2. Install the sensor sub assembly front.
3. Install the brake hose bracket.
   **Tightening torque:**
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
4. Install the stabilizer link front (upper part). Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER LINK.
5. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
6. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
7. Perform VSC (VDC) sensor midpoint setting mode. Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VSCCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

# FRONT SUSPENSION > Front Strut

## DISASSEMBLY

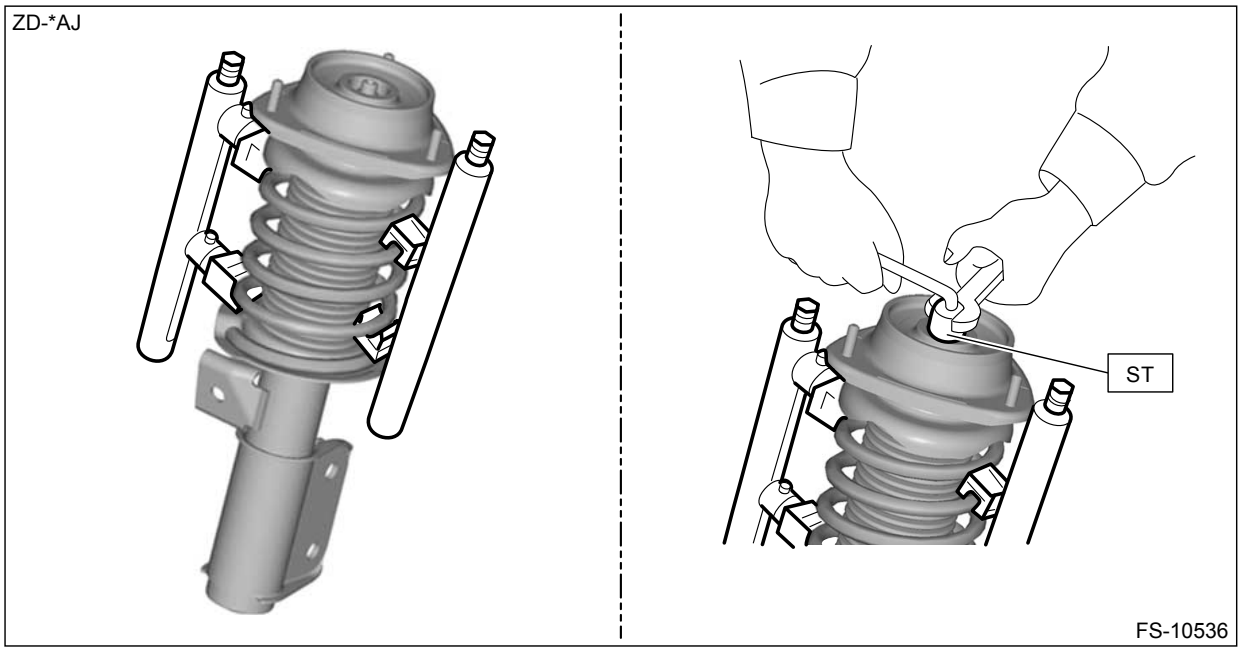

**Caution:**
- **When installing the coil spring compressor to the coil spring front, follow the operation manual accompanied with the coil spring compressor during operation.**
- **Do not use an impact wrench to compress the coil spring front.**

1. Using a coil spring compressor, compress the coil spring front.
2. Remove the dust seal.
3. Remove the mount strut front.

**Note:**

**<Example of coil spring compressor installation>**

**The installing position of coil spring compressor varies depending on the coil spring front shape and winding number.**




(1) Using a hexagon wrench, prevent the strut rod of strut COMPL front from turning.

(2) Using the ST, remove the self-locking nut.

**Preparation tool:**

ST: STRUT MOUNT SOCKET (20399AG000)

(3) Remove the mount strut front, the spring seat UPR front, the rubber seat UPR front, and the dust cover front from the strut COMPL front.

***4.*** Gradually decrease the compression pressure of compressor, and remove the coil spring front.

***5.*** Remove the helper front.

## FRONT SUSPENSION > Front Strut

## ASSEMBLY

**Caution:**

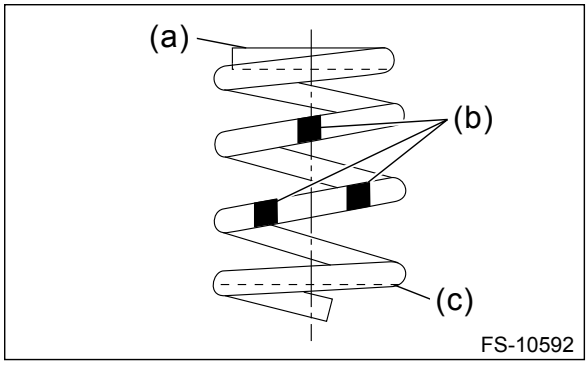
- **When installing the coil spring compressor to the coil spring front, follow the operation manual accompanied with the coil spring compressor during operation.**
- **Do not use an impact wrench to compress the coil spring front.**
- **For the non-reusable parts, always use new parts.**

***1.*** Before assembly, check each part. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.

***2.*** Using a coil spring compressor, compress the coil spring front.

**Note:**

**Make sure that the vertical installation direction of the coil spring front is as shown in the figure.**

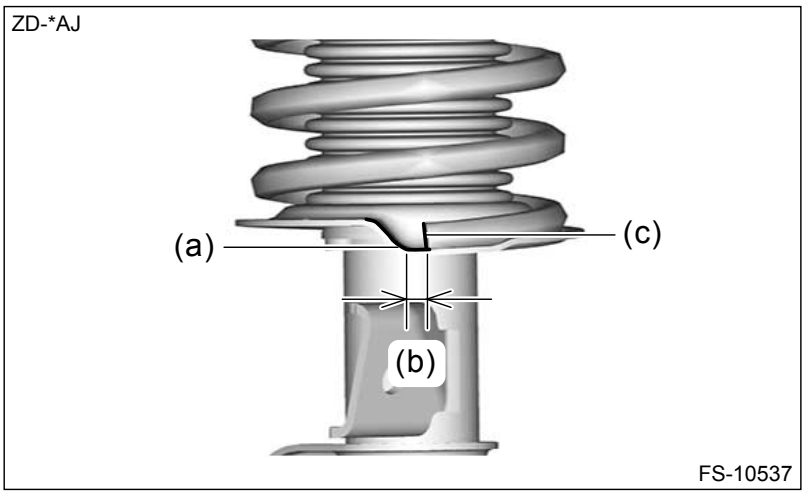



(a) Diameter is small (upper part)

(b) Identification paint

(c) Diameter is large (bottom part)

**3.** Install the coil spring front correctly to the spring seat as shown in the figure.




(a) Spring seat stopper portion

(b) 0 — 10 mm (0 — 0.39 in)

(c) Spring end face

**4.** Install the helper front to the piston rod.

**5.** Pull the piston rod fully upward, and install the dust cover front.

**6.** Install the mount strut front.

(1) Temporarily assemble the rubber seat UPR front, the spring seat UPR front, and the mount strut front, and install it to the piston rod.

(2) Temporarily install the mount strut front with a new self-locking nut.

(3) Using a hexagon wrench, prevent the piston rod of strut COMPL front from turning.

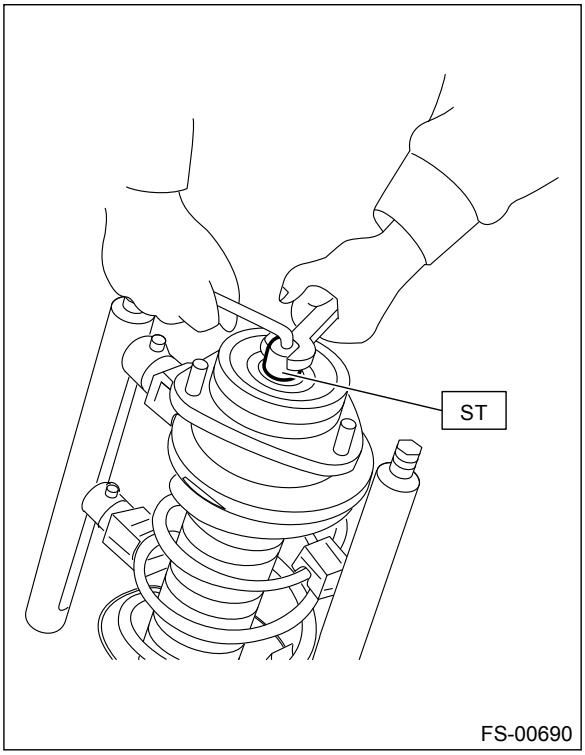
(4) Using the ST, tighten the self-locking nut to the specified torque.

**Preparation tool:**

ST: STRUT MOUNT SOCKET (20399AG000)

**Tightening torque:**

55 N·m (5.6 kgf-m, 40.6 ft-lb)



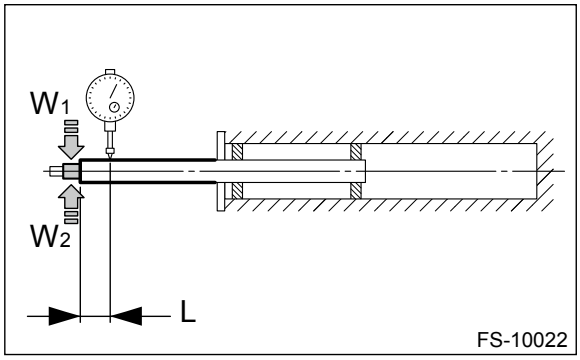

7. Loosen the coil spring compressor carefully.
8. Install the dust seal.

## FRONT SUSPENSION > Front Strut

## INSPECTION

### 1. STRUT COMPL FRONT

1. Check for oil leaks.
2. Move the piston rod up and down to check that it operates smoothly without any hitch.
3. Check the piston rod for runout using the dial gauge and magnet stand.
   (1) Fix the outer shell.
   (2) Extend the piston rod until it stops retracting, and set the dial gauge at the L position from the end of the piston rod.
   **Measuring point:**
   L = 10 mm (0.39 in)
   (3) While applying a force of $W_1$ [20 N (2 kgf, 4 lbf)] to the arrowed section, read the dial gauge indication $P_1$.
   (4) While applying a force of $W_2$ [20 N (2 kgf, 4 lbf)] from the opposite side of $W_1$, read the dial gauge indication $P_2$.
   **Play limit (P1+P2):**
   0.8 mm (0.031 in)




4. Replace the strut COMPL front if a fault is found in the inspection or limit value is exceeded.

## 2. MOUNT STRUT FRONT

Check the rubber part for deformation, cracks or deterioration, and then replace it with a new part if defective.

## 3. RUBBER SEAT UPR FRONT

If cracks or damage are found, replace it with a new part.

## 4. SPRING SEAT UPR FRONT

If cracks or damage are found, replace it with a new part.

## 5. COIL SPRING FRONT

If cracks, damage or deformation are found on the spring, replace it with a new part.

## 6. HELPER FRONT

If major cracks or damage are found, replace it with a new part.

## 7. DUST COVER FRONT

If major cracks or damage are found, replace it with a new part.



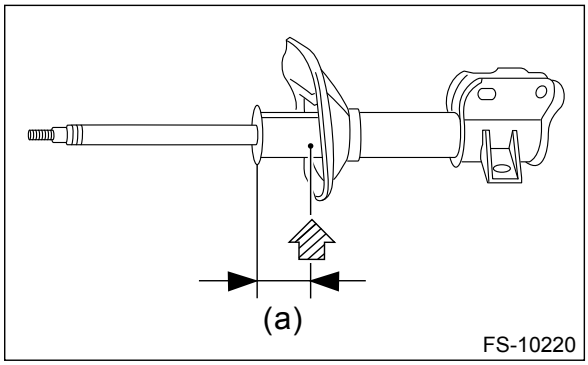
# DISPOSAL

**Caution:**

- **Before handling the strut COMPL front and the shock absorber COMPL rear, be sure to wear goggles to protect eyes from gas, oil and cutting powder.**
- **Do not disassemble the strut COMPL front and the shock absorber COMPL rear or throw them into flames.**
- **When discarding the strut COMPL front and the shock absorber COMPL rear filled with gas, use a saw to make a cut on them to purge the gas.**

1. Place the strut COMPL front and the shock absorber COMPL rear on a level surface with the piston rod fully expanded.

**2.** Use a saw and make a cut at the location shown in the figure to purge the gas.

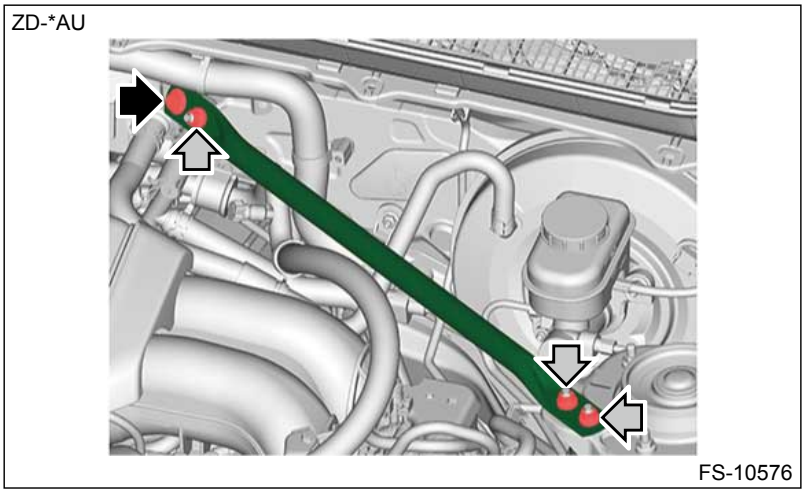



(a) 40 mm (1.57 in)

## FRONT SUSPENSION > Strut Tower Bar

## REMOVAL

1. Remove the bolts and nuts, and then remove the strut tower bar.




## FRONT SUSPENSION > Strut Tower Bar

## INSTALLATION

**Caution:**

**For parts which are not reusable, always use new parts.**

1. Using new flange bolts and flange nuts, install the strut tower bar.

   **Tightening torque:**

   16 N·m (1.6 kgf-m, 11.8 ft-lb)

## INSPECTION

### 1. IMPROPER VEHICLE POSTURE OR IMPROPER SUSPENSION HEIGHT

| Possible cause | Corrective action |
|---|---|
| (1) Deformation, permanent distortion or damage of suspension parts | Replace. |
| (2) Rough operation of strut COMPL front or shock absorber COMPL rear | Replace. |
| (3) Improper installation of strut assembly or shock absorber assembly | Replace with appropriate parts. |
| (4) Installation of the wrong coil spring | Replace with appropriate parts. |

### 2. POOR RIDE COMFORT

1. Large rebound shock.
2. Rocking of the vehicle continues too long after running over bump and hump.
3. Excessive shock in bumping.

| Possible cause | Corrective action |
|---|---|
| (1) Damaged coil spring | Replace. |
| (2) Overinflation of tires | Adjust to the specified air pressure. |
| (3) Improper suspension height | Replace the coil springs with new parts. |
| (4) Defective operation of strut COMPL front or shock absorber COMPL rear | Replace. |
| (5) Damage or deformation of mount strut front or mount shock absorber rear | Replace. |
| (6) Unsuitable length (maximum or minimum) of strut COMPL front or shock absorber COMPL rear | Replace with appropriate parts. |
| (7) Abnormal deformation or loss of bushing | Replace. |
| (8) Deformation or damage of helper in strut assembly or shock absorber assembly | Replace. |
| (9) Oil leakage from the strut COMPL front or shock absorber COMPL rear | Replace. |

### 3. NOISE

| Possible cause | Corrective action |
|---|---|
| (1) Wear or damage of strut COMPL front or shock absorber COMPL rear component parts | Replace. |
| (2) Loosening of the suspension link or arm installing bolt | Tighten to the specified torque. |
| (3) Abnormal deformation or loss of bushing | Replace. |
| (4) Unsuitable length (maximum or minimum) of strut COMPL | Replace with appropriate parts. |

| | |
|---|---|
| front or shock absorber COMPL rear | |
| (5) Damaged coil spring | Replace. |
| (6) Wear or damage of the ball joint | Replace. |
| (7) Deformation of the clamp stabilizer or bushing | Replace. |